PB-230 524

POLLUTION OF THE INTERSTATE WATERS OF THE ESCAMBIA RIVER BASIN (ALABAMA-FLORIDA) AND THE INTRASTATE PORTIONS OF THE ESCAMBIA BASIN WITHIN THE STATE OF FLORIDA. PROCEEDINGS OF CONFERENCE HELD AT GULF BREEZE, FLORIDA ON JANUARY 21-22, 1970. VOLUME 2

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CONFERENCE IN THE MATTER OF POLLUTION OF THE INTERSTATE WATERS OF THE ESCAMBIA RIVER BASIN (ALABAMA-FLORIDA) AND THE INTRASTATE PORTIONS OF THE ESCAMBIA BASIN WITHIN THE STATE OF FLORIDA - VOLUME II

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THE ASSIMILATION BEHAVIOR OF CERTAIN TOXIC ORGANIC COMPOUNDS IN NATURAL WATER*

BY A. B. CHERRY, A. J. GARACCIA, AND H. W. SENN

Industrial Waste Department, Lederle Laboratories Division, American Cyanamid Company, Pearl River, N. Y.

The problem of controlling the industrial pollution being discharged into the natural waters of the United States is one that evokes the interest and concern of the specialist and layman alike. This situation has been particularly true over the past decade. During this time, the collective minds of science and industry have developed and manufactured a great variety of new products, complex of nature, but geared to simplifying the tasks and enhancing the standards of everyday living. It is difficult to realize that many of these new advances, which have proven such boons to society, ironically carry along with them certain definite and serious threats.

The organic chemical industry is constantly producing new products which create new types of pollutants. Since the physical and chemical properties of these pollutants vary widely and often contain substances which are new to nature, the problem of pollution control becomes quite complex. A number of these compounds are known to be toxic, but the information available on others is quite meager. Some are discharged in concentrations well below those considered objectionable when appraised by the normal standards of stream sanitation. Because of the diversity of the organic chemical industry's waste waters, an adequate appraisal of their pollutional significance is often difficult. Realistic judgment of the pollution problem from such plants requires techniques of effluent examination specially devised for this industry. The procedures normally employed in the examination of sewage require modification.

It has been established that sanitary sewage is made up primarily of protein material, carbohydrates, fats and urea, and is fairly constant in its composition. It can be easily oxidized because these constituents are found in nature and a wide variety of microorganisms capable of utilizing the organic food in sewage as a source of energy and growth has been developed. The story can be decidedly different with some industrial wastes, many of them containing organic chemicals which are not readily attacked biologically. The difficulty experienced in treating these compounds lies in the fact that because they are so rare in nature, organisms able to utilize these materials as food are not numerous in the soil and natural water. These necessary organisms must be developed if a valid estimation of the pollutional characteristics of a chemical manufacturing plant waste is to be obtained. To arrive at this evalution, a method should be employed which can form a basis for the determination not only of the B.O.D., but also for determining the safe level of discharge into natural waters of the pollutants under study. This method should also consider, if possible, the toxicity, fertilization and physical change factors as well.

The behavior of several complex organic compounds in natural waters is discussed in this paper. Studies were undertaken in order to provide American Cyanamid Co. designing engineers with specific data on certain current stream pollution problems.

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* Presented at 1956 Annual Meeting, New Jersey Sewage and Industrial Wastes Assn.; Atlantic City, N. J.; Mar. 14–16, 1956.

Historical Background

In recent years a great deal of interest and activity has been centered around the disposal and treatment difficulties connected with the discharge of synthetic organic chemicals. In 1949, Heukelekian developed a method of biological oxidation commonly referred to as "dispersed seed aeration." This process consisted essentially of developing a dispersed biological growth from a fresh soil innoculation, and then aerating certain strong, soluble, non-toxic organic wastes in the presence of these nonflocculent growths (1). Subsequently, Lamb and Jenkins (2) presented a paper based on long-term B.O.D. data for synthetic organic materials. The results of their work led them to conclude that these synthetic compounds were not attacked biochemically in the same manner as sanitary sewage, and that an acclimated seed was required in order to properly determine the B.O.D. However, they did not find river-water samples to be a reliable source of seed or dilution water for their biochemical analyses. Additional information relating to the use of the dispersed seed aeration method in obtaining long-term B.O.D. and toxicity values was presented by Mills and Stack (3).

At various times, both in the United States and abroad, investigations were carried out to examine the properties and behaviors of cyanogenic wastes. Daugherty and Garrett (4) established tolerance values for acrylonitrile and lactonitrile. Renn (5) established essentially the same relationships for these chemicals and found that fin-fish used in the bioassay tests could tolerate an acrylonitrile-N level between 10 and 18 p.p.m. In England, Ware and Painter (6) isolated a bacterium which could utilize as food cyanide concentrations up to 150 p.p.m.

Later, Mills and Stack (7) presented another discussion which included a procedure for the acclimation of microorganisms. This study was to determine if mixed cultures and the associated enzymes could be developed when the feed material consisted only of the organic substance being studied and the inorganic materials necessary as growth factors. The matrix was a river-water sample taken some distance downstream from the chemical effluent discharge point. At the location chosen, it was estimated that some acclimation of the normal stream organisms might be expected. The final evaluation of any culture which developed was based on the ability of that culture to oxidize the specific organic material in a B.O.D. determination.

It was decided to use the Mills and Stack procedures with appropriate modifications. The determination of an exact B.O.D. value was of secondary interest. The primary concern was to establish the safe level of discharge into natural waters of the pollutants assigned for study. These were acrylonitrile (AN), acrylamide monomer (AMD) and oxydipropionitrile (ODP).

Techniques and Procedures

The stream problem presented by these wastes could be divided into three separate categories:

1. Effect of possible interference with biological treatment processes,
2. Effect on aquatic life in the receiving streams, and
3. Effect on downstream potable water supplies.

Expanding upon these phases, the following points were considered:

1. Do these pollutants create a threat to treatment plant biota?

2. What is the effect of these compounds on the higher levels of stream aquatic life?

3. If natural forces in the receiving stream would alter the pollutants so as to render them non-toxic, then the difficult problem of cumulative toxicity in downstream public water supplies would be avoided.

Direct testing methods for many of the chemicals studied were either not fully developed, or else the laboratory was not equipped to carry them out with sufficient accuracy. In lieu of a direct analysis for the compounds under examination, a modified "Standard Methods" C.O.D. analysis was used as an indicator test. Pursuant to the investigation at hand, the following procedures and techniques were employed:

1. The C.O.D. value of the pure compound was first determined.
2. Water samples were withdrawn from the Hackensack River prior to its entrance into the impounding reservoirs of a potable water supply, and at a point which was located above any significant source of man-made pollution.
3. The samples were filtered in the laboratory to remove any gross particulate matter, and then placed in 9-l. bottles. Each container held 8 l.
4. The air to all the bottles was first bubbled through a saturated sodium hydroxide solution, and then through a water bath (Figure 1). Filtration through cotton completed the steps of preparing the air for use in the experiments.

Aeration of the bottles was effected by bubbling air through the water at a rate of about one bubble per second. The exhaust air was normally permitted to escape through an open glass tube, except in those experiments which required sterilized controls. Then the exhaust air in the control bottles was taken out through non-absorbent cotton plugs.

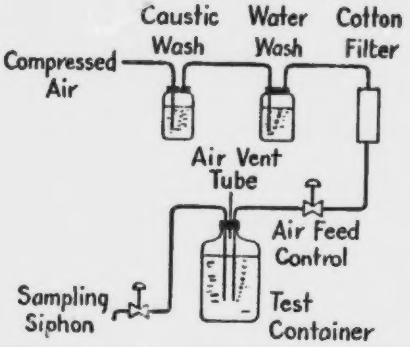


FIGURE 1.—Schematic diagram of stream assimilation apparatus.

5. When the bottles were in place (Figure 2) the test chemicals were added at predetermined concentrations. Normally, all test concentrations were set up and run in duplicate.
6. Inorganic nutrient materials were also added to supply the stream organisms with a favorable environment. The quantities of these nutrients were based on the C.O.D. strengths in each container. One part phosphorus as P was added for each 100 p.p.m. of C.O.D. Reagent grade potassium mono-basic phosphate was used. One part nitrogen as N was added for 10 to 15 p.p.m. of C.O.D. Reagent grade ammonium sulfate was used.
7. The pH of the test bottles was normally maintained between 6.0 and 8.0 by adjustment with sulfuric acid or sodium hydroxide, unless the nature of the material under investigation required closer pH control.
8. The tests were conducted at normal laboratory ambient temperatures.

C.O.D. Results

The C.O.D. test modified to fit the conditions of the experiments was the major analytical tool used. Microscopic examinations were also made.

The relationships of C.O.D. strengths against time for some of the chemicals tested illustrate the varying acceptability of the chemicals as biological foods.

FIGURE 2.—Laboratory apparatus for the stream assimilation tests.

Acrylonitrile

Figure 3 shows the result obtained for 10 p.p.m. acrylonitrile. This is a synthetic organic chemical compound, moderately toxic even in low concentrations, used in the manufacture of synthetic rubbers and fibers, solvents, textiles, dyes, and paper. The length of initial acclimation for 10 p.p.m. acrylonitrile was about 20 days, and the C.O.D. reduction time was reduced after subsequent redosings, once the original acclimation had been effected. This chemical was tested at 25 and 50 p.p.m. concentrations with similar results.

Due to the high volatility of acrylonitrile, autoclaved samples of river water collected at the same time were dosed with this chemical to determine whether aeration would account for any reduction in the C.O.D. due to the dose. During the time of this test, the C.O.D. of the control bottles showed little or no change.

Oxydipropionitrile

Oxydipropionitrile is an unwanted by-product of certain acrylonitrile uses resulting from the union of two acrylonitrile molecules with one molecule of water to form a new compound. It then becomes a disposal problem. Although it is closely akin chemically to acrlyonitrile, oxydipropionitrile is not as readily available as a biological food. Ninety-five days of contact time were required to accomplish the initial acclimation (Figure 4). New river water samples were redosed with oxydipropionitrile and seeded with water from the original run and the rate of C.O.D. reduction was again substantially reduced.

Acrylamide Monomer

Acrylamide monomer is a nitrile reaction product of acrylonitrile, moderately toxic in low concentrations. It is an intermediate in the manufacture of flocculating and thickening agents, synthetic fibers and rubbers, soil conditioners, textiles, and dyes.

Test concentrations of 10 and 20 p.p.m. of acrylamide monomer were used. Figure 5 shows a concentration level of 10 p.p.m. of this chemical to be rapidly assimilated by the organisms present in natural stream water.

Not all materials studied showed a decrease in C.O.D. to the practical zero level. Figure 6 shows the "plateau effect" produced by a plant waste containing a mixture of complex organic compounds when only a portion of the C.O.D. was removed biologically. It will be noticed that the initial C.O.D. concentration dropped rapidly to about

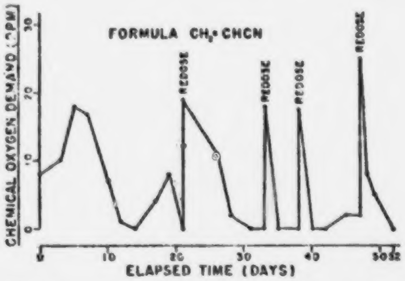
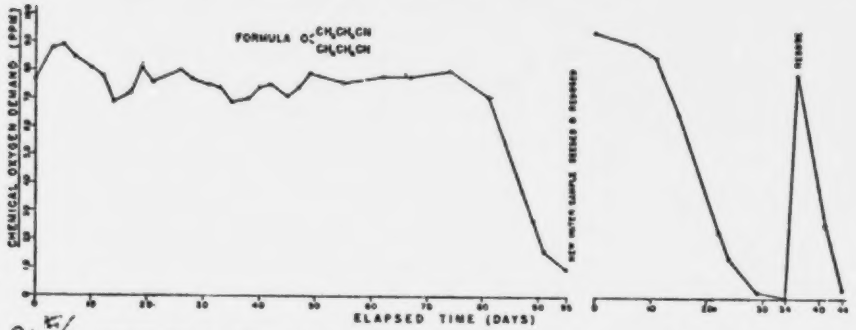


FIGURE 3.—Elapsed time curve versus C.O.D. for acrylonitrile.



TOD=2.71

FIGURE 4.—Elapsed time curve versus C.O.D. oxydipropionitrile.

30 per cent of its original strength. On subsequent redosing, the C.O.D. was again quickly reduced but to only about one-half of the original strength, stabilizing at a higher level. This residual material remained as biologically unoxidizable organic matter even after 114 days of contact time.

Microscopic Examinations

Although the C.O.D. analysis was the primary analytical tool, the frequent use of a microscope was of inestimable help. Microscopic examinations permitted insight into biological activity that could be obtained in no other way and returned more than a full measure of the value of time and materials needed. A few samples of photomicrographs are included to show how this tool may be used.

Acrylonitrile

Growth developed in the 10 and 25 p.p.m. acrylonitrile test containers. Figure 7 shows the abundance of zoogleal and algal growths. At times it is advantageous to increase the magnification to aid in further identification and closer examination. The life range found in these test bottles was balanced and heterogeneous. It ran the gamut from bacteria and diatoms, to algae, protozoa, and as high as the rotatoria organisms.

The assimilation curves for 50 p.p.m. acrylonitrile sometimes exhibited erratic results which were difficult to explain by C.O.D. analysis alone. However, a microscopic examination (Figure 8) of the biota developed in the 50 p.p.m. acrylonitrile containers showed a marked difference between this growth and the growth shown in Figure 7. The biota were predominantly fungal with few other life forms present. This served to indicate that acrylonitrile concentrations at this level would not be desirable in a stream. As a practical consideration in biological waste treatment processes or in biological assimilation by streams, growths as specific as these could carry the oxidative process along only a part of the total path.

Oxydipropionitrile

The microscope again proved a valuable aid in this phase of the investigation. For about 60 days of the test

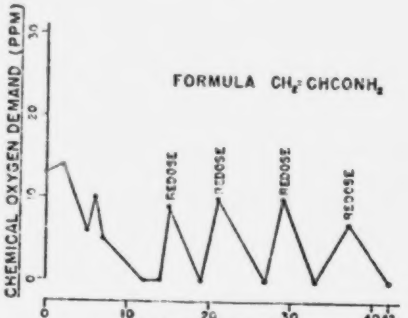


FIGURE 5.—Elapsed time curve versus C.O.D. for acrylamide monomer.

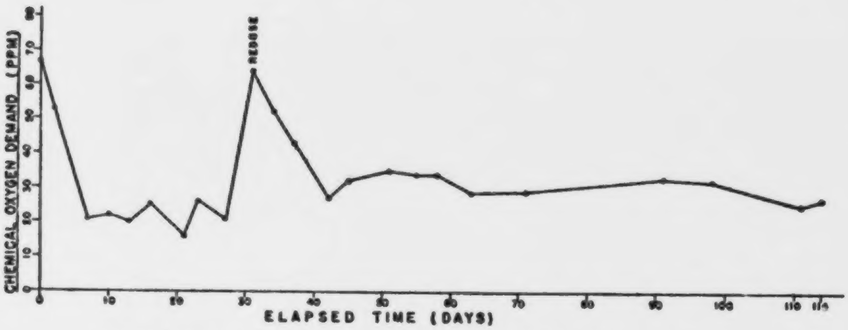


FIGURE 6.—Elapsed time curve versus C.O.D. for mixed waste.

run on oxydipropionitrile no significant change was found in the C.O.D. value, and the biological growth differed little from that shown in Figure 9. Shortly thereafter, a marked buildup of diatoms began (Figure 10). It was on the strength of this favorable sign that the test was continued. Gradually, other organisms became more numerous and the C.O.D. strength dropped.

Acrylamide Monomer

Microscopic examination of test bottles containing 10 p.p.m. acrylamide monomer showed the biota developed was mixed and healthy. In addition, a curious type of "spined"

FIGURE 7.—Zoogleal and algal growth found in test bottle containing 10 p.p.m. acrylonitrile.

FIGURE 8.—Predominantly fungal growths found in test bottle containing 50 p.p.m. acrylonitrile.

FIGURE 9.—Growth found in oxydipropionitrile test bottles prior to acclimation.

cell (Figure 11) developed only in mixtures of acrylonitrile and acrylamide monomer.

Other Methods

It will be recalled that part of the stream problem presented by these wastes pertained to possible interference with biological treatment processes. Where the possibility of biological treatment was indicated or contemplated, the treatability of the wastes was qualitatively determined on the rotary tube filters (8). This apparatus (Figure 12) may be simply set up as a single-pass screening unit, or by the inclusion of a suitable laboratory-sized pump, varying recirculation flows may be added to produce a more elaborate installation with greater flexibility.

The acute toxicity of acrylamide monomer with respect to fin-fish was determined by Renn (9). The essence of his findings was that moderately tolerant species of fresh-water fish such as the black-head minnow (*Pimephales promelas*) may be expected to survive for two weeks or more in acrylamide concentrations of less than 60 p.p.m. Marked mortalities are likely to occur at concentrations greater than 1,000 p.p.m.

FIGURE 10.—Growth found in oxydipropionitrile test bottles after acclimation. Note presence of diatoms.

FIGURE 11.—Growth found in test bottles containing a mixture of acrylamide monomer and acrylonitrile. Note "spined" cells.

Discussion

Standard 5-day B.O.D. determinations were made on some of the chemicals tested, using as seed the organisms which had been developed in the bottle experiments. It is interesting to note the value and necessity for determining a B.O.D. by using an acclimated seed.

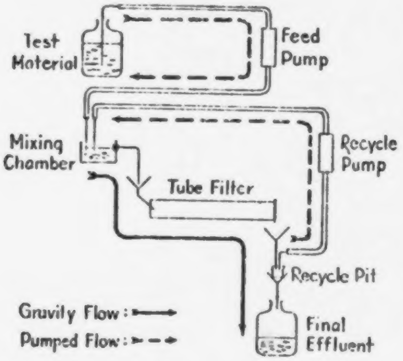


FIGURE 12.—Schematic diagram of a rotary tube filter.

Chemical and Seed	B.O.D. (p.p.m.)	C.O.D. (p.p.m.)
Acrylonitrile with acrylonitrile seed	721,000	1,612,500
Acrylamide monomer with acrylamide monomer seed	972,000	1,300,000
Acrylamide monomer with acrylonitrile seed	217,000	—
Acrylamide monomer with sewage seed	168,500	—
Oxydipropionitrile	Undetermined	—

The B.O.D. determinations of acrylamide monomer, using a seed material acclimated to another organic substance (acrylonitrile), yielded only 22 per cent of the actual value as found with the seed developed for acrylamide monomer. A standard sewage-seed determination produced a value of 17 per cent of the actual value. From this it may be seen that the strength of a new synthetic compound could unknowingly be greatly underestimated.

In a paper by Wyss (10) on microbial adaptation, he discusses the methods used by microorganisms in adjusting to those conditions which challenge their existence. These may include evolutionary adaptations (mutation) and physiological adaptation (adaptive enzyme formation). The remarks made in his presentation have direct bearing on a better understanding of the assimilation behavior of complex organic compounds in natural waters. It is possible that both of these adaptation processes are involved in the assimilation work herein reported.

Conclusion

The work to date indicates that certain classes of organic chemical compounds, specifically acrylonitrile, acrylamide monomer, and oxydipropionitrile, may be tolerated by nature to a measurable degree and converted by natural forces into simpler and better understood chemical substances. This work has provided a basis for determining the type and degree of effluent treatment needed, and tolerable levels in streams. It also has practical application in that it provides the stream sanitation worker with a tool for measuring the cumulative effects of drainage from certain manufacturing areas into recreational country. Under the conditions of these tests, it appears that the compounds studied present no material threat to the biological life in the receiving streams, provided appropriate steps are taken to keep the concentrations safely below tolerance limits.

Acknowledgments

The authors appreciate the guidance and encouragement of R. M. Nee and R. F. Burghardt, respectively, Chief Engineer and Assistant Chief Engineer, Lederle Laboratories Division, and L. L. Hedgepeth, Staff Consultant, Organic Chemicals Division, American Cyanamid Company. Appreciation is also expressed for the assistance and advice of H. Heukelekian, C. Renn, and H. Tresner.

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PLANNING A WASTE SURVEY *

BY L. L. HEDGEPETH, A. J. GABACCIA, C. G. MAURIELLO AND H. W. SENN

Respectively, Senior Consultant, Engineering and Construction Division; Head, Industrial Waste Department, Lederle Laboratories Division; Sanitary Engineer, Lederle Laboratories Division; and Technician, Industrial Waste Laboratory, Lederle Laboratories Division, American Cyanamid Company

Experience with control of industrial pollution has shown that the principal differences between it and the control of pollution from municipal sewage are the widely varying qualities of industrial wastes as contrasted with the universal nature of sewage, and the everchanging pattern of industry's operations as contrasted with the regularity of human dietary and environmental habits. In other words, industrial wastes vary from plant to plant, whereas the type of pollution from sewage is unchanged in major characteristics from locality to locality. Furthermore, industry is continually adjusting its processes to supply varying consumer demands, whereas changes in the living habits of people occur gradually and over relatively long periods of time.

These dissimilarities cause emphasis to be placed in different places in the pollution control programs for industry as compared with municipalities. An industrial process which may be outmoded at any time by competition, or the changing tastes of consumers, is not best served with a treatment plant with long life expectancy built into it; but forty years of useful service is the basis on which financiers advance money for construction of sewage plants. Industry finds that the most satisfactory and effective approach to its problem is to adjust its operations internally so as to reduce its pollution to the point where the conventional processes of equalization, neutralization, sedimentation, skimming and diffusion will provide adequate treatment. Such treatment is useful in all types of industrial waste water disposal and may be installed with assurance that its useful life expectancy will be realized. Although it will provide satisfactory control of sludge deposits, "slugging," and harmful pH fluctuations, it will not in itself provide adequate control for the toxicity, discolorations, high BOD, or mineralization factors characteristic of many industrial waste problems.

The control of this latter group of pollution factors demands special survey attention which, to be successful, must go beyond customary effluent survey procedure. It must, by proper means, look into processing plans, the schedules of production, the sacred seclusion of research, and prepare itself for budget justification.

Pollution Control a Part of Planning

American Cyanamid's policy requires that new processes, expansions and future planning be reviewed for the adequacy of stream pollution control steps by a group empowered to act. Research personnel must anticipate pollution control steps in developing new processes, and engineering does not proceed until pollution questions have been satisfactorily answered.

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* Presented at the Florida Industrial Wastes Workshop; Lakeland, Fla.; Aug. 12–14, 1947.

Out of the planning of various groups for new plants or expansions are developed estimates of costs of pollution control. These are included in projected operating costs for the new facility, thus insuring that pollution control will be a part of day-to-day operations.

Close cooperation with state and duly authorized civic bodies dealing with pollution control is another phase of the company's progressive approach to this vital factor in its relationships with plant communities. This attitude has earned the company a reputation for leadership in the development of pollution control for its new installations.

For existing plants the company's usual mechanism is to place responsibility on each local plant manager for keeping pollution under control and to provide him with such technical assistance as he requests—including the application of new pollution control systems as they are developed.

An Example

The Brewster, Fla., plant is an example of industrial pollution control. Here, since 1915, the company has mined, washed and graded phosphate ores. The waste wash waters pose a slime and stream siltation problem that was solved by local management through the installation of a system of clarifying lagoons through which the waste waters are slowly passed. The clay and sand which cause the stream pollution from phosphate mining are retained in these lagoons and the effluent is exceptionally clear.

Control of stream pollution at Brewster is a permanent program under the direct and personal supervision of the local manager. Lakes and streams in the area are a particular source of local pride, and there is grave concern over the possibility of pollution. This means that the control systems must be kept under constant supervision, and there must be on hand accurate data concerning the release of effluent into public waters.

Plant management at Brewster has consistently demonstrated its willingness to discuss and permit inspection of its pollution control systems by state officials, public groups, and the press. This policy has gone a long way toward convincing the public that the company recognizes its obligations to the community in control of pollution.

In other words, it is considered basic to an approach to stream pollution to take steps to control effluents, to study constantly and record data on the control program, and to let the state and the public know what is being done.

New Problems with Fluorides

Recently, the job of controlling pollution at the Brewster plant was amplified when the manufacture of triple superphosphate was commenced. While this plant was being designed, particular attention was given to stream pollution that might result from this operation; the principal concern was with fluorides which would be in the wastes and which occur naturally in the phosphate rock deposits underlying much of the surface in the area. Because of the rather high toxicity of fluorides to fish and livestock, it was necessary that the effluent be treated to remove the possibility of stream pollution. Such treatment was made a part of the project and is now in operation at Brewster.

Simple Sampling Stations

Particular stress has been placed on the monitoring of stream conditions, both above and below the outfall. The program began about one year before the new operation was started and is being continued. Today three automatic sampling stations are in service:

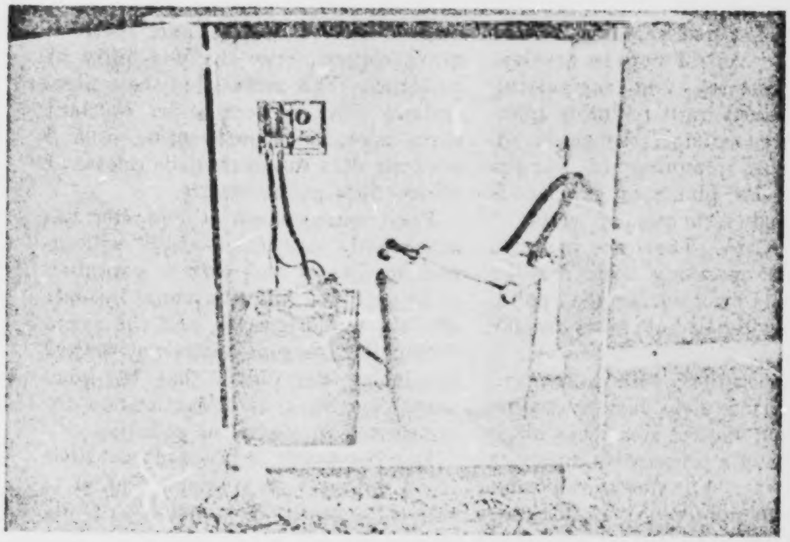

FIGURE 1.—All-metal welded shelter houses simple but efficient and inexpensive, automatic, battery-operated sampling station.

on the effluent outfall, on the stream above the point of effluent entry, and on the stream below the effluent entry.

This equipment was developed specially for the Brewster job and represents an improvement over the type used by the company for a number of years.

This battery-operated unit (Figure 1) is placed on the side of the stream and its sample is withdrawn from the stream from beneath an anchored float that can be positioned wherever desired. The battery operates a motor and pump that deliver a predetermined volume of water to a receiver every 15 min. A unique timing device operates the pump and motor. The timer is adjustable to give collection of any desired water volume during any particular time interval. Samples so collected may be composited for subsequent analyses. The battery-operated feature permits the sampler to be located where power is not available, and the automatic feature substantially eliminates the labor of sampling.

In addition to installing modern control systems, the company has made it a practice to be frank on the question of pollution control, to exchange technical information with others in industry, to keep regulatory authorities and the community informed of its progress in pollution control, and to welcome the establishment of reasonable standards and methods for the control of pollution under state auspices.

Santa Rosa Plant

An example of new facility pollution control planning is the Santa Rosa plant, now under construction on the eastern shore of Escambia Bay near Milton, Fla. Its case history of pollution control will illustrate this approach.

This plant will make Creslan * acrylic fiber from acrylonitrile through a series of steps involving polymerization and wet spinning. It will draw its water supply from the aquifers underlying the site and will discharge its waste waters offshore into Escambia Bay.

Nearly all of the raw materials used

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* A registered trademark of American Cyanamid Co.

in this process will emerge from the plant as products or will be recovered for re-use. But there will be some losses to the sewers and these losses presented a problem of pollution evaluation. This is a new fiber with certain unique properties. Likewise, the pollution problem involved in its manufacture is unique. There was no precedent to point the way and the problem had to be worked out along with the development of the manufacturing process.

The job of planning an effective program of pollution control actually began more than five years ago, long before the company made its final decision to produce its own fiber. At that time, Cyanamid's Stamford (Conn.) Research Laboratories was the site of a pilot plant in which an acrylic fiber was being experimentally produced by a wet-spinning technique similar to that which will be employed in the new Santa Rosa plant.

The first key to the effluent problems associated with this fiber came when the City of Stamford reported that sewage from the company's research laboratories had increased consumption of chlorine at the municipal plant. Investigation showed the source of the problem to be the fiber pilot plant, and the pollutant causing the high chlorine demand to be a water-soluble thiocyanate.

Research solved the immediate problem through special internal treatment of the pilot-plant effluent. It also recognized the importance of the matter by placing pollution control on the acrylic fiber development agenda. Methods of disposal of thiocyanate wastes were studied and a literature reference was found to a specific bacterium which Happold and Key (1) had isolated in England from sewage slimes which were found to be oxidizing thiocyanate wastes.

Stamford personnel wrote to Happold and received a culture of his organism, *B. thiocyan oxidans*. Experiments showed that it would grow in the wastes and destroy the chlorine demand.

Research then turned the matter over to the engineering section for preliminary planning and rough estimates. The question was asked: "What data would be required for plant site evaluation for effluent disposal?" A comprehensive study of the problem as a whole was requested.

This was granted and the customary pollution criteria—solids, BOD, toxicity, color, pH, and odor—were determined at Stamford and at The Johns Hopkins University. Johns Hopkins-type tubular filters (2) were installed at Stamford for collecting order-of-magnitude data. Early in the work with this unit it was found that Happold's organism, isolated from sewage in England, was also present in the soil of the Stamford lawn. Therefore, special seeding with *B. thiocyan oxidans* would be unnecessary.

Subsequent work at Pearl River has shown that this bacterium is present in all of the natural waters used there in the Creslan effluent work, including Escambia Bay water. This means that it will be possible to make a reasonable use of the assimilation resources of the receiving waters.

The conclusions from the early laboratory work enabled preparation of tentative effluent disposal requirements for plant site selection use and that phase of the project commenced.

Research continued its work on the fiber process; in due course, serious planning was commenced for a manufacturing plant using an improved process. Engineering was asked to devise a program which would yield firm data for plant site selection. Accordingly, the work was "farmed out" to the Lederle Industrial Waste Laboratory at Pearl River, N. Y., and to The Johns Hopkins University. The following questions were proposed:

1. What is the true BOD of this effluent?
2. What is its assimilation behavior?
3. Is its sludge toxic, or putrescible?
4. Will the pollutants, or the sequela of their biological oxidation, cause an odor in the receiving waters to affect water supplies or fish?
5. What is the toxicity of this effluent to fish?
6. Will this effluent discolor the receiving waters?

It was felt that firm answers to these questions would provide management with the information it had requested. Considerable progress in the method-

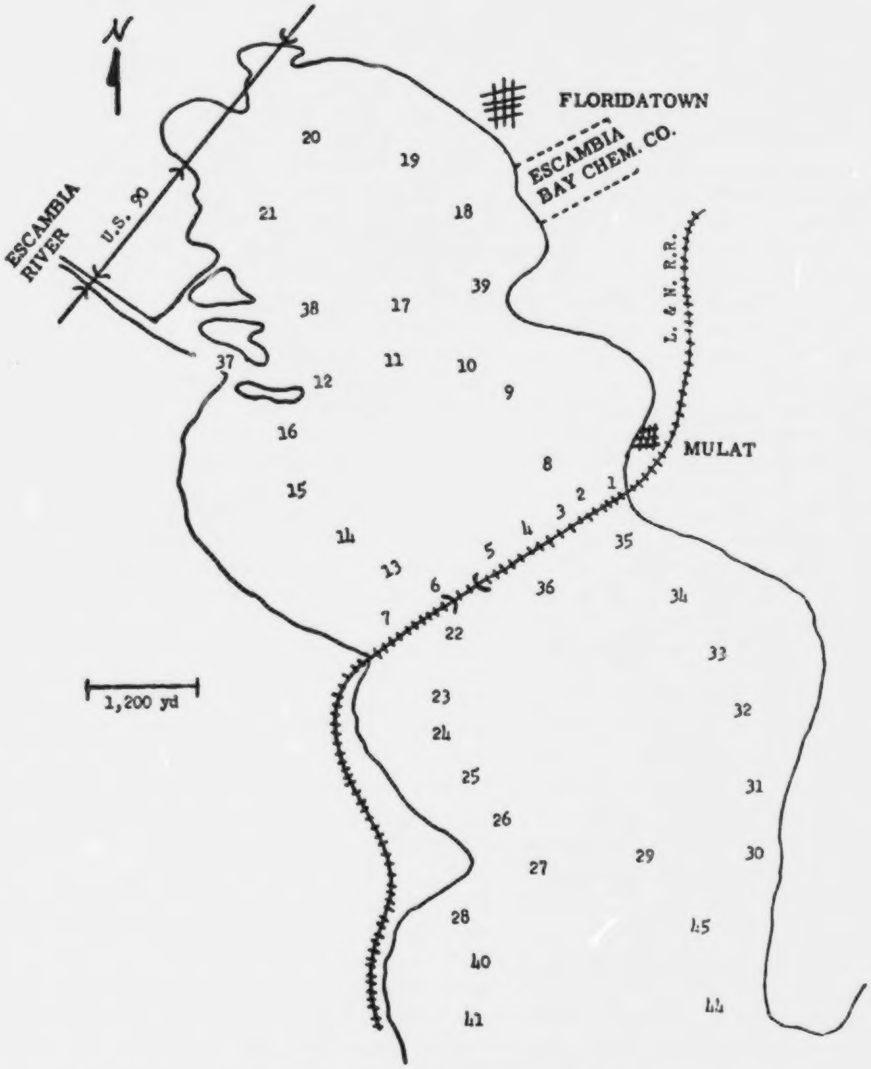
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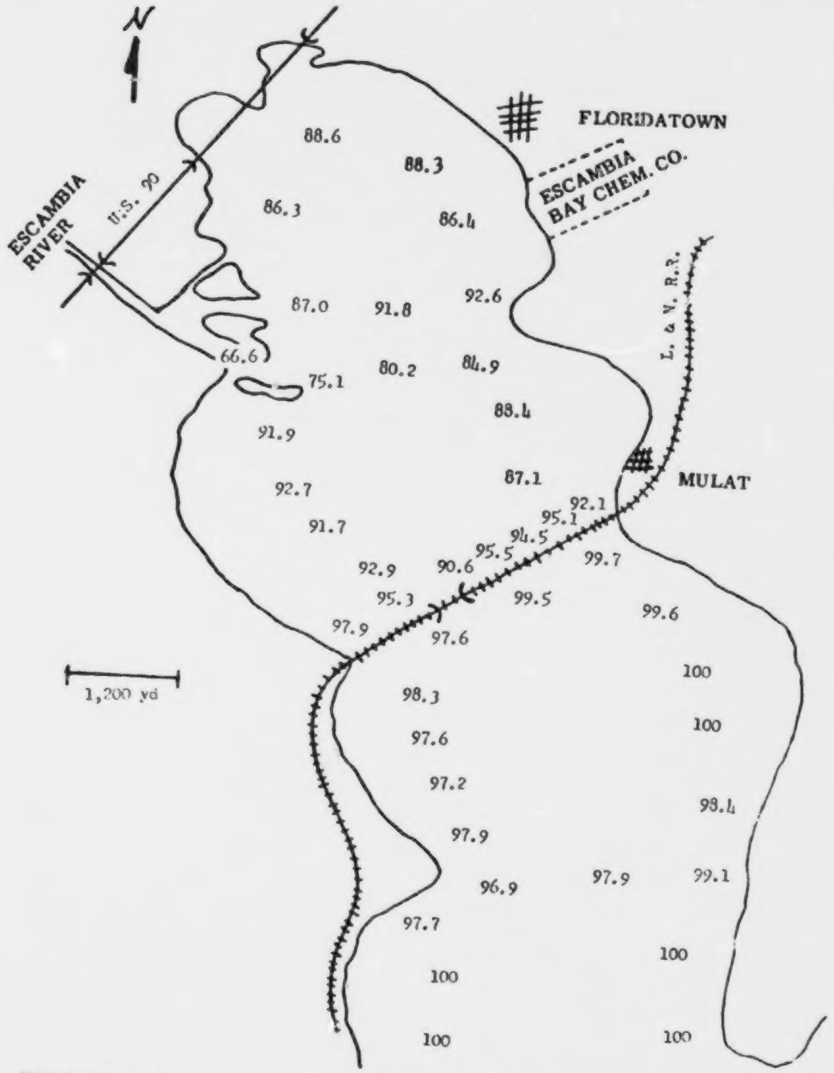
FIGURE 2.—Location of sampling stations, Escambia Bay survey, May and September 1956.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99.1
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100

FIGURE 3.—Average per cent DO saturation, April 24 through May 30, 1956.

ology of industrial pollution measurements had been made since the early work, and it was possible to be more specific in these later studies.

Considerable aid was gained from the information published by Lamb and Jenkins (3) on BOD values for synthetic compounds, by Mills and Stack (4) on BOD techniques, by Cherry, Gabaccia, and Senn (5) on assimilation behavior techniques, by Daugherty and Garrett (6) on the toxicity of organic cyanides, and by Renn (7) on biological tolerances of acrylonitrile and related compounds. This phase of the work was completed in 1956. The findings were:

1. The BOD of the wastes would, at its worst, be from 2½ to 3 lb of 5-day BOD per 100 lb of fiber produced.

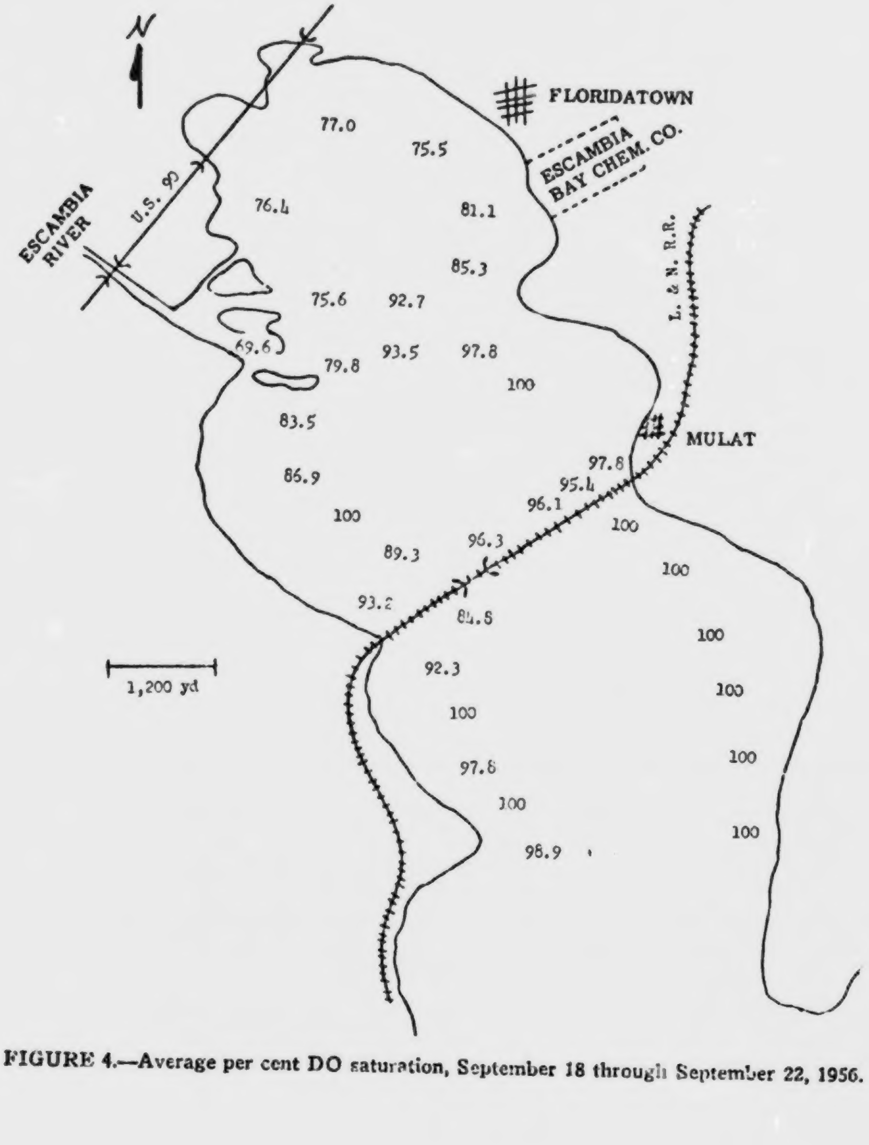
2. About two-thirds of the total organic carbon would be assimilated by the receiving waters and about one-third would be unaffected.

3. The sludge from the fresh unsettled effluent was toxic to fish. The settled effluent was not of toxic significance. The sludge was stable.

4. The threshold odor of the total effluent, when dispersed in odor-free water, was 1 in 200,000. After biological assimilation this odor was reduced by about 50 per cent.

5. Fish tolerated 15,000 ppm of the settled effluent for extended periods without toxic manifestations.

6. The settled effluent was without apparent color and produced no discoloration in the assimilation study bottles.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MULAT
1,200 yd
77.0
75.5
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81.1
85.3
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92.7
69.6
79.8
93.5
97.8
100
83.5
86.9
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97.8
95.4
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89.3
96.3
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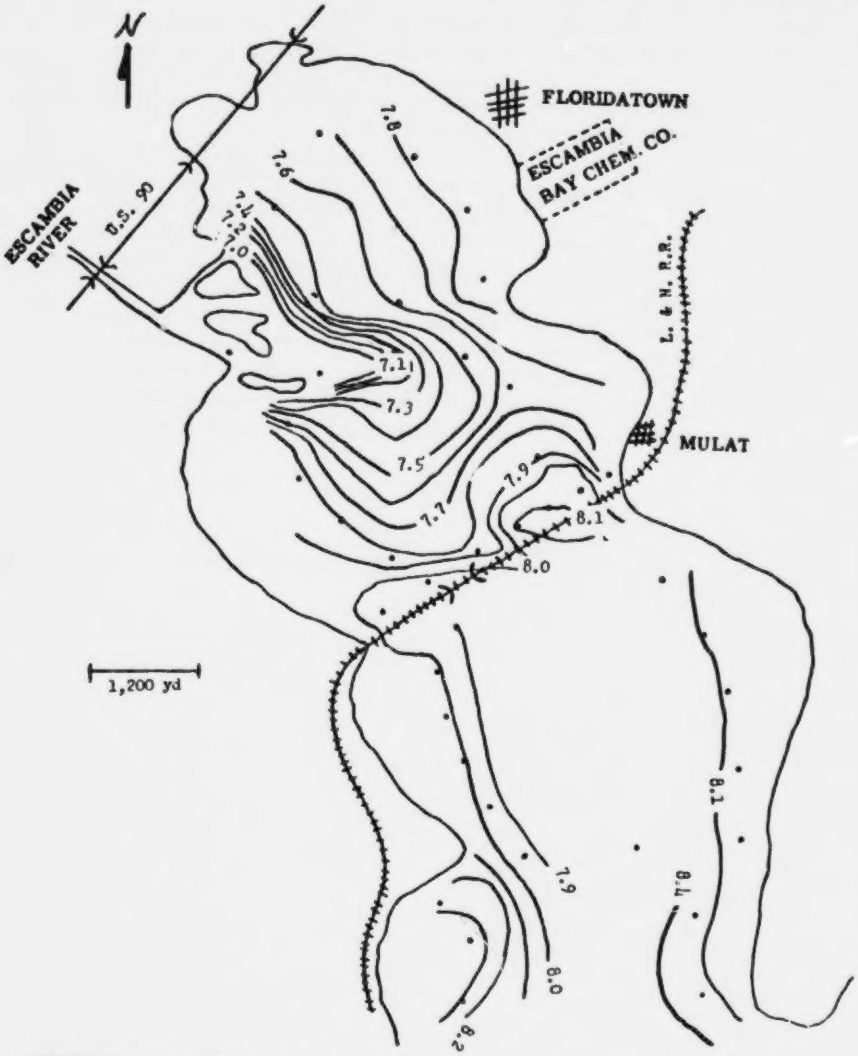
FIGURE 4.—Average per cent DO saturation, September 18 through September 22, 1956.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ESCAMBIA BAY CHEM. CO.
L. & N. R.R.
MULAT
1,200 yd
7.8
7.6
7.4
7.2
7.0
7.1
7.3
7.5
7.7
7.9
8.1
8.0
8.1
7.9
8.1
8.0
8.2

FIGURE 5.—Dissolved oxygen profile (in ppm), April 24 through May 30, 1956.

Consideration of these data caused the drawing of conclusions which may be summed up as follows:

1. Regardless of the site selected, the acrylic fiber wastes must be well equalized and receive primary treatment. Further, the settleable and flotable solids so removed must be retained behind permanent and non-floodable dikes.

2. If the site selected has a minimum of 500 cfs flow of diluting water in the receiving stream, no further reduction of BOD is needed in addition to primary treatment.

3. If these minimum diluting requirements for BOD are provided, there will be no difficulties with fish toxicities, or with odors in the receiving waters.

4. When site selection has been made, the validity of the biological conclusions must be established for the receiving waters.

5. Sludge impound odors and stream discolorations will not be a problem with these wastes.

Thus by these means, after several years of work, by 1956 a logical basis had been acquired for effluent disposal judgment of proposed plant sites. A number in which management was interested were found suitable. Others were dismissed. Management looked with favor on the Pensacola area site on Escambia Bay and asked if flowing stream data could be interpreted for this tidal estuary. The reply was affirmative with a judgment opinion, but it was pointed out that the dissolved oxygen recovery resources of the bay should be determined in order to be certain.

Both the time and the appropriation were granted. In late April and May, and in September 1956, a team from the Pearl River laboratory made surveys of the bay daily from Monday through Friday each week and also brought Escambia Bay water back to Pearl River for validation checks of the biological conclusions. The assimilation behavior of these wastes in fresh water was found to be confirmed in the

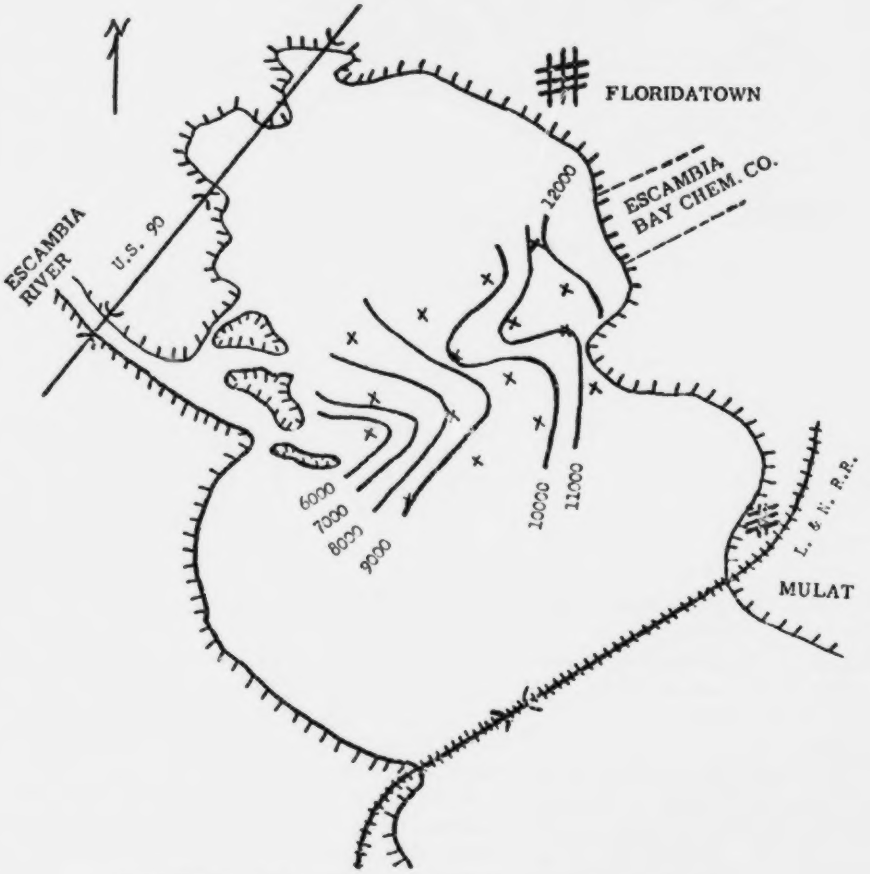

FIGURE 6.—Salinity profile (in ppm), September 20–21, 1956.

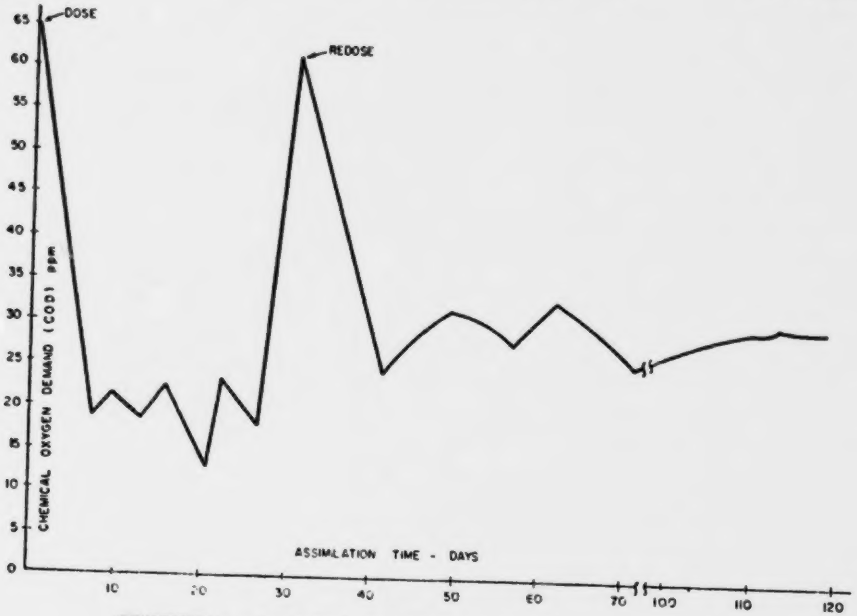

FIGURE 7.—Assimilation behavior of Creslan wastes, 1955–56.

saline Escambia Bay water. The dissolved oxygen and salinity survey data are shown in Figures 2 through 6. Figure 2 shows the sampling stations established in the bay. Figure 3 shows the average dissolved oxygen values found in the April–May survey, expressed as per cent saturation; Figure 4 shows these values for the September survey. Figure 5 shows the dissolved oxygen profile of the bay during the April–May survey period. Figure 6 shows the salinity of the upper bay during the September survey period.

Figure 7 shows the assimilation behavior curve for the Creslan acrylic fiber wastes. It will be noted that not all of the Creslan acrylic fiber COD was biologically consumed. Further, that on subsequent redosing, the COD residuals tended to "plateau" at a higher level, indicating an unassimilable fraction. The studies show that this is about one-third of the influent COD. (This phenomenon is not unusual in industrial waste work. Not all organic compounds are relished by the biota. The classic example is oxalic acid and its salts; although it is made commercially by biological processes, it exhibits no BOD in natural waters.)

It was concluded that there were ample dissolved oxygen resources in the bay; that the primary reaeration effect was from wind action ruffling the bay waters; that the diurnal effects were secondary to those of the winds; and that the salinity of the upper bay indicated a good tidal exchange.

Management selected the Escambia Bay site and the data, judgments, and conclusions were presented to the Florida State Board of Health. Facilities are now being designed for the disposal of sanitary sewage and industrial wastes to fit the problem as now understood and to meet the state requirements.

These will include primary treatment, sludge digestion, disinfection, and lagooning of the sanitary sewage and cafeteria wastes. The industrial waste waters will be neutralized, equalized, settled, skimmed, and lagooned. The sludge and scum will be retained on shore behind permanent dikes. The lagoon effluent will be diffused into Escambia Bay in a 1,500-ft wide zone about 1 mile offshore. The BOD of the effluent will be kept within assimilable limits through internal steps, principally recovery and re-use.

In retrospect, it is felt that this approach of alert caution has been in the best interests of the people of the State of Florida and of the company. A comprehensive study has been made of this problem because time was made available to do so by the early attention of research to the pollution phases of a proposed new process and, of equal importance, the backing of management was extended at all times.

If there has been any error in the interpretation of the data, or if any essential factors have been overlooked, it is felt that the excellent understanding of the process, and the knowledge of the biological behavior of the wastes, will enable making any necessary further provisions to comply with the company's understanding with the state—that there be no pollution of Escambia Bay waters from the Santa Rosa plant.

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5. Cherry, A., Gabaccia, A., and Senn, H., "Assimilation Behavior of Certain Toxic Organic Compounds in Natural Waters." This Journal, **28**, 9, 1137 (Sept. 1956).
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MR. STEIN: Do you have any comments or questions?

MR. PATTON: I have a question.

MR. STEIN: Yes.

MR. PATTON: I noticed on page 6 of Mr. Kenngott's presentation, he talks about concentration of acrylonitrile at less than or about 30 mg/l, and then he says it is not detectable in the bay acjacent to the disperser nozzles.

I wonder if you would clarify what appears to be somewhat of a discrepancy there?

MR. KENNGOTT: The Federal report gives a value for the concentration in the effluent. Likewise, 30 mg/l stated here, as I mentioned numerous analysis of our effluents, indicate a concentration of 30 mg/l in the effluent before it reaches the bay. We are not able to detect any acrylonitrile in the bay, and I am told that the accuracy of the analysis is to a half a part per million.

MR. PATTON: Thank you, sir.

It makes me wonder, Mr. Chairman, is there a difference in analytical procedures or methods that American Cyanamid uses to say it is not dependable and the Federal works apparently indicates that it is very much dependable.

MR. KENNGOTT: May I clarify this?

When we talk about the effluents, we both detected the -- the Federal report is one sample of 100 mg/l. We say that numerous samples showed 30 mg/l in the effluent. There is nothing in the Federal report which talks about the concentration of acrylonitrile in the bay. We submit to you that we can find no acrylonitrile in the bay next to our point of dispersion.

MR. THOMAN: Mr. Gallagher, what are the details of the analyses that were made of American Cyanamid effluents on the acrylonitrile?

MR. GALLAGHER: The acrylonitrile concentrations result from a grab sample that was collected from the effluent. The quantity of acrylonitrile was determined to be about 100 mg/l.

Mr. Kenngott states that their results are about 30 mg/l. We did not measure acrylonitrile in the bay. We did not perform the analysis in the bay.

MR. KENNGOTT: May I ask: Was that just one sample that you ran?

MR. GALLAGHER: Yes.

MR. KEENGOTT: I point out that our results are on at least -- somewhere between eight and a dozen samples, and we have not had any values anywhere approaching the figure reported in this report.

I do point out also in this page that we are willing to work with the appropriate people to resolve any possible analytical differences, and we would be happy to have Mr. Gallagher and his representatives review this. Nowhere in the analytical procedures is there given a method to follow so we are at a loss to know what procedure was followed in arriving at the number included in this report.

MR. THOMAN: How was that done, Tom?

MR. GALLAGHER: I will call on Mr. Knight who was the analytical chemist who did this. Mr. Wade Knight.

MR. KNIGHT: A sample of the effluent was injected into a gas chromatograph by direct aqueous injection. The peak was significant. The retention time matched that of acrylonitrile. The acrylonitrile was confirmed by mass spectrometry.

The acrylonitrile was quantitative by gas chromatography against a standard acrylonitrile.

MR. THOMAN: Where did the standard come from?

MR. KNIGHT: It was made up in the laboratory.

MR. THOMAN: But who made the acrylonitrile, American Cyanamid, by any chance?

MR. KNIGHT: I don't know, Mr. Thoman. I can find out.

MR. THOMAN: Usually we use products produced by the primary manufacturer.

MR. STEIN: Sometimes we get them from a competitor, Mr. Thoman!

MR. KENNGOTT: If you wish to use high quality, I suggest you use Cyanamid's. (Laughter and applause)

MR. STEIN: If we did that, you can't tell what the test findings showed.

MR. KENNGOTT: I recognize, and I am not in a position to tell the procedure we use, because I am not that qualified in the field, however, we do invite Mr. Knight or any other person to visit our plant and see if we can resolve these differences.

MR. STEIN: Right. And I think we are way ahead. Let me ask -- do you have any more?

MR. THOMAN: No, I just wanted to clear up here an apparent or possible apparent difference in semantics and nomenclature.

Mr. Gallagher, was your intent that it was a 1200 foot outfall or that the diffusing section was 1200 feet?

MR. GALLAGHER: Yes, it was the diffuser section that was 1200 feet.

MR. THOMAN: Okay.

MR. KENNGOTT: May I continue on that?

This may be entirely correct. However, in the text of the report, there does seem to be an implication that our outfall was relatively close to the shore, and we wish to point out that this is not the case.

MR. STEIN: No, I think they are in agreement with that, and I am glad you cleared that up.

In other words, the point is where you indicate that they may have made a mistake on the length of your outfall in attributing something to Cyanamid was not so because they did make a mistake. They recognized it was 5000 feet and your diffuser line was 1200. They may have made other mistakes but that wasn't one they made.

MR. PATTON: Mr. Chairman, I would like to ask another question for clarification in the comment there that Mr. Kenngott makes about sodium thiocyanate. He says, "Furthermore, our fish bioassay tests show that bay fish continue to live in high concentrations of our effluent."

I wonder if he could put a name to that word "high."

MR. KENNGOTT: As I have read in this report, we are talking about concentrations of 75 percent of our effluents and 25 percent bay water.

MR. STEIN: Mr. Kenngott, when you asked, in view of the kind of report we made, as I understand it, that you wanted to make a further study, how long do you figure that study will take?

MR. KENNGOTT: I am not qualified to answer that, sir. I think that the Federal people are knowledgeable people in the area of sampling and would be much better qualified to answer that than I.

MR. STEIN: But your proposal here is: "After looking at this study," and when you are asked to comment on what you are going to do about it, "our proposal is to have another study."

MR. KENNGOTT: Not necessarily. I simply point out that there are a great number of conclusions drawn from ten samples taken in a relatively short period of time in one month of the year, and this seems to be a very sketchy basis on which to involve literally millions of dollars of expense.

MR. STEIN: As I understand it, again, and I think we have discussed this -- Mr. Carey and Mr. Cline -- it is a question that I think the report indicated that they computed the total amounts of the nutrients coming into the bay. Now, if these are valid, and these nutrients are creating the problem, then it seems to me that we are --

we may have to decide on that and move onto a question if we are going to control this evaluation.

You see the problem that I have is that everyone has done a wonderful job, but you have had fish kill after fish kill, and people send me clippings almost weekly about Escambia Bay. Now, if everyone has complied, you have done all this wonderful research, everyone has done a job, and what we have to do is go out and study this some more, I think while we are studying it, I think you and I have to tell the people up here that they are just going to have another seventeen fish kills while we are studying.

Do you think this is a recommendation we can make?

MR. KENNGOTT: I can't agree with your interpretation. As has been said by my predecessors here, and as I have included in my report: We are all working to meet the requirements that have come about by the recently or last year approved Chapter 28-505 and you, of course, are making certain recommendations in your report. We simply feel that to make serious recommendations of this type, based on ten samples in a period of two weeks is a somewhat sketchy basis.

MR. THOMAN: Mr. Kenngott, if I were in your position, and charged with making recommendations to management on the expenditure of money, I might take that position, too.

At the same time, though, from the standpoint of a regulatory agency, I might question as to whether or not you weren't performing better at that time than our results indicated.

MR. KENNGOTT: That is entirely possible.

MR. THOMAN: I think there are two different things here, and I think Mr. Stein is trying to draw this out—that we have to get to some basis of further action, and if, after detailed studies, Cyanamid and the others find out that they have either more or less, then we might have been ill advised in the allocations. The question we are trying to decide here is: Does, in fact, something have to be done?

MR. KENNGOTT: I agree with your approach to management, and I can only say that I feel that this Federal report is an approach to management because everyone sitting in this room is a taxpayer and, as such, we participate hopefully in the management of our country.

MR. STEIN: Now, again -- and I don't know if you have done this, but we have a record on massive fish kills on the Lower Mississippi River, when a plant there said -- it seems almost duplicated in your argument -- that you found no fish killed within what -- a half a mile? --

MR. KENNGOTT: One to 2 miles.

MR. STEIN: -- of your outfall.

MR. KENNGOTT: May I interrupt?

MR. STEIN: Yes.

MR. KENNGOTT: You use this figure because, as you mentioned and has been mentioned in the press, there have been something like eight fish kills in the Mulat-Mulatto Bayou area in the year 1969. Being the nearest plant to that location obviously we are most suspect.

I point out that it is about a mile and a half from the discharge point of our outfall line to Mulat-Mulatto Bayou and that there were no dead fish in the bay between those points.

MR. STEIN: Yes. Well, the question again -- and let me tell you: we have had another experience, and I am not drawing a parallel, but I want to relate the experience because of the logical or possible logical consequences.

We had a plant which we zeroed in on in the Memphis area. We were getting fish kills way in the Lower Mississippi below New Orleans, and they said that there were no fish killed near their plant; therefore, the stuff couldn't have traveled that far.

For our satisfaction, we traced it; we stopped the discharge. The plant put in remedial facilities and there have been no fish kills since in the Lower Mississippi like this, although millions of fish were being killed year after year.

Now, the question that we raise is: Sure there were no fish being killed near the point of the plant discharge, but there was no evidence there were any live fish there to be killed either, and the point is you are just saying there were no fish killed there. When you get a fish kill, you get it in the marginal place where the fish remain alive and certain conditions change where those fish are killed.

Now, I make no logical conclusions here, but the fact that there were no fish killed near the point of discharge of where something alleged to cause fish to come out is pretty characteristic, that is usually the case.

MR. KENNGOTT: If I may respond to that, the thought has occurred to us as well. It is fact that at the time there were fish kills in Mulat-Mulatto Bayou -- and I report that there were no fish kills between the two areas, that is Mulat-Mulatto Bayou and our outfall -- we observed numerous mullet jumping in the area between those two areas, so I submit, sir, there were live fish in that area. I think it is a valid point, but I think we have answered that.

MR. STEIN: Well, I hope so. I hope so.

Again, we have had that argument, again, where we have had numerous fish jumping, and then when we sent our biologists down to check on the jumping, they have reported back that they were in there last paroxysms of life before they expired. So, you know, without getting this, I just can't make the judgment.

Let me give you another point. You indicate -- and this kind of amazes me -- on the last page you say "the first indication of the importance of nitrogen and phosphates to Escambia Bay was made June 18, 1969, when Mr. Paul Traina reported at the formative meeting of the West Florida Resources Council."

Now, we have had Chesapeake Bay, Lake Erie -- that has been in all of the newspapers -- the New York Sound, the Potomac River, and you mean to say with the presence of your company that did all this pilot work in advance that it took Mr. Paul Traina until June 1969 to indicate to you that there might be a nutrient problem in an estuary? I really can't understand that.

MR. KENNGOTT: Let me say several things here:

G. J. Kenngott

1) Going back to the report which you have a copy of, it shows that the discharge of our effluent into Escambia Bay would not cause any trouble to fish or aquatic life.

2) I also submit to you that there is no nitrate, phosphate, or total organic carbon limitation in the present specifications which, up until this time at least, industry has been asked to comply with.

MR. STEIN: Well, let me again make two points:

1) I would suggest that although you might be surprised, if you get your substance subjected to mass spectroscopy and gas chromotography and people look at it in parts per trillion, they may be able to find it. These are techniques which go way beyond the ordinary technique of detection. If they have to do this -- and it is an expensive thing -- we do it to get the evidence, and I know that the Florida authorities recognize that when they called us in.

We would like to have your comments on the situation we have here on the contents on Table 6. Let's get to the totals first. And I don't know that it makes any difference where this diffuser is or who is putting it out where. If the totals are correct that they said in the report -- and we have to get down to these totals not to have any fish kills -- do you agree with that, and if these totals are correct, are you prepared to work with us and the other companies for an equitable allocation, or do you believe we need further and further studies to come up with totals before you will agree to the first step?

MR. KENNGOTT: We certainly agree that the conditions in Escambia Bay require improvement and we, as I have indicated in here, will cooperate to the maximum in achieving that. We will comment on the specific amounts within the 15-day period that you have agreed to receive comments.*

MR. STEIN: Right. Okay. And I think we all should do that.

Let me give you this as I see it. They say, and I agree, that as far as both States, the Federal Government, and certainly the companies involved here are concerned, if we are going to come up with a remedial program, it should be equitable. I think given the data today, there is going to be a remedial program coming forth one way or the other.

If it is going to be equitable, we have to get an agreed-upon allocation of loadings to indicate what each plant is going to do. I believe

*See Pp. 574-589

Escambia Bay Chemical and Monsanto have made that clear. They believe that the equities of the case are important. I think in defense to the people, to the regulatory agencies, and the companies themselves, unless we get agreed-upon figures by all of you to start from, I submit the best we are going to be able to do is set up a table like this which we and possibly the other regulatory agencies — because I don't know that they agree to this -- agree is equitable.

I suggest if the companies can come up with an agreement on the figures on the bottom, we will have enough flexibility to use the philosophy indicated by Mr. Carey on trying to work out equitable results within that. If we don't achieve that, you have to recognize that we are going to have to move down that road with the regulatory agencies taking the full responsibility and making the judgments.

Now, again, let me give you my experience. Whenever we have done this in the past, we have found we get some companies coming along and cooperating and some not. We are usually able to strike an agreement with some companies. But the ones that are left out, without coming into this voluntary agreement, are under an order, and when they come in a year or two later, they may feel that they are pushed against.

I think the best thing for all concerned is if within this 15 days we can have a basis of all coming to an agreement to see if we can solve this together, because I am sure this will help us and will help you people. No one in any single operation here is going to have all of the knowledge on this.

MR. KENNGOTT: I certainly hope -- and I did not mean to give an impression, if you felt that Cyanamid was opposed to this in any way.

We have said at the beginning, at the end, and I can only repeat: that we certainly are conscientious citizens and intend to do all that is necessary to bring a solution to this problem.

MR. STEIN: Okay.

Any further questions or comments?

Thank you very much.

Let's take a five-minute recess.

(Short recess.)

MR. STEIN: Let's reconvene.

Mr. Reed.

MR. REED: Mr. Patton, proceed with the Florida speakers.

MR. PATTON: Mr. Chairman, as the next item on the agenda today, we have been informed by a representative of Gulf Power Company that they will submit a written statement within 15 days to go into the record of the conference.

MR. STEIN: Do they wish to make a statement?

MR. PATTON: No, sir. They said that they did not wish to make a presentation.

MR. STEIN: I don't know if the Gulf representative is here, but that is one of the companies that has been cited as putting in heat that the report recommends be cut down, and I would hope that Gulf's statement would cover that aspect of the situation.

With that, without objection, Gulf will be given 15 days.*

MR. PATTON: The next item: Do we have a representative of the L&N Railroad Company here who wishes to make a statement?

MR. STEIN: Even though you make a negative report, we are going to have to have your name for the record.

MR. DAVIS: William Guy Davis, Attorney.

MR. STEIN: Will you come up and give her your name, please?

* See Pages 541-548

Let me go off the record.

(Discussion off the record.)

STATEMENT OF WILLIAM GUY DAVIS, JR., ATTORNEY, REPRESENTING L&N RAILROAD, PENSACOLA, FLORIDA

MR. DAVIS: William Guy Davis, Jr., Attorney, representing the L&N.

We just got notice of the meeting and had not had a chance even to go over the report. There will be no report. We will probably make some written statement within the 15 days, if allowed.

Thank you.

MR. STEIN: You will be allowed, and we will hope to get a statement if you see your way clear to do it.

MR. DAVIS: Thank you.

MR. PATTON: Next is Mr. James M. Walker, Jr., Director, Gulf Atlantic Oceanographic Research Society, of Pensacola, Florida.

Is Mr. Walker here, and does he still want to make a presentation? Apparently not.

Next, Mr. Edward P. Staros, Realtor, Chamber of Commerce, Santa Rosa County, Milton, Florida. Apparently he has changed his mind.

FROM THE FLOOR: He is here somewhere.

MR. PATTON: He was here, I know.

Next, Mr. J. P. Burnett, President, Avalon Civic League, Avalon Beach, Milton. Is Mr. Burnett here?

STATEMENT OF J. P. BURNETT, PRESIDENT, AVALON CIVIC LEAGUE, AVALON BEACH, MILTON, FLORIDA

MR. BURNETT: My name is James P. Burnett -- everybody calls me Jasper for some reason or another -- of Avalon Beach Real Estate, Milton, Florida.

Mr. Chairman, ladies and gentlemen. I don't want to make very much of a statement, but about 10 years ago, I retired, and my wife inherited a beautiful piece of property on the bayou and we moved in there and we spent quite a little money building a home and putting it in fine shape.

However and fortunately I have gotten my own fish pond and don't have to worry about the fish. But way back when we moved there why we could build us a boat dock and we could catch all of the fish we wanted right there on the bayou without any problem at all. Later on, we needed access to the waterfront, so we blasted a bayou all of the way through so that we could have water coming through in a steady stream of water.

Well, after that had happened -- the I-10 -- they filled our pond, our bayou, full of sand, dirt, and everything else. So, finally, we thought that when the State highway came in why we would be all right. But when they filled our canal up, that put us over close to the shoreline and, therefore, the only thing we got now is mud and silt to go through when we take our boats out. And honestly when there is low tide you just can't make it.

What we was hoping they would do, they would consider taking that mud out of the bayou so that we would have a flowing stream from under the shore trestles all of the way through to the bayou. We haven't got very much now, and on a high tide you can get my boat out, but we have a fellow by the name of Martison that has a boat that he came down the Mississippi and down the Intracoastal Waterway, and he can't even get his boat out of there. It is a great big thing, and I just don't know what we can do, but we would appreciate any consideration you could give us on it.

Thank you very much for this opportunity.

MR. STEIN: Thank you.

MR. PATTON: The next person that has asked to be heard is Dr. Floyd T. Neth, Chemist, Pensacola, Florida.

Dr. Neth.

STATEMENT OF DR. FLOYD T. NETH, CHEMIST, PENSACOLA, FLORIDA

DR. NETH: I am Floyd T. Neth. I am an independent; not associated with any organization; and speaking as a citizen, from a technological background as a Ph.D. physical chemist.

It seems to me that some of the things that have arisen in the meeting are imminently clear. The first is that we have a pollution problem in Escambia Bay. It has been responsible for fish kills. It is associated I think correctly with nutrient enrichment of the bay, and I think that this is beyond argument at this point. I think that the sources of pollution have not been adequately brought out.

Certainly the location of pollution from the plants in the area is fairly well established. Whether or not these completely eliminated as sources of pollution will solve the problem, I think, is another question.

It appears to me that there are several other

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sources of pollution that should be considered and may well prove to work against a solution to the problem as it is apparently being proposed here. One of these is agricultural wastes. I happen to own some farmland in Alabama and I know how much nitrogen we put on that. We put it on in the form of ammonia and ammonia nitrate, both highly soluble. A certain percentage of that in the rain inevitably goes into the water system and runs off.

We have a large agricultural industry in the north end of Escambia County, the water of which flows into two estuaries: 1) Escambia Bay; and 2) Perdido Bay.

Escambia Chemical sells a lot of ammonium nitrate to the farmers in the north end of the county. How severe this problem is I do not know. I think, as a chemist, that at the time these reports were made that it would have been a relatively minor source of nitrogen in the bay for two reasons:

1) It was stated in the report that the data was collected during a dry period in September. I think the statement was made that the normal rainfall for September was of the order of 7 inches, and we had had something in the neighborhood of 4 inches. September is a time when nitrogen is not being used by the agricultural community. The crops which require nitrogen primarily are

the corn that has matured long before that, winter pastures which have not been planted yet. This is the time of year when the farmer is harvesting the soybeans, which is the main crop. So I think this source of nitrogen was probably overlooked in the analysis.

2) A second source that was not included or may not have been included for some of the same reasons was a considerable amount of effluent from private sewage disposal systems. These are individually dispersed systems, small subdivision systems, that have effluent, and thousands of individual septic tanks which put out a certain amount of nitrogenous and carbonaceous effluents.

3) A third source is that which is brought down by the rainfall, which was formed by the effluent from smoke stacks of the various chemical companies, power-producing companies, and others who burn materials which have nitrogen as a part of their components. Much of this nitrogen will end up as nitrogen dioxide upon reacting with the water. In rain it will be converted to nitric acid and brought down in the rainfall.

Some sources of this -- and these are my personal observations, and I may be sued for mentioning it, but I will take that chance -- I think the agricultural plant of American Agricultural Chemical Company puts

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out a considerable amount of dinitrogen trioxide in their smoke stacks. Coal has certain components of nitrogens in it, and I suspect that Gulf Power, in its processing, puts out a certain amount of nitrogen in the air. Up until recently, I noted from the yellow smoke coming out of Monsanto's stacks that Monsanto has been guilty of this, although this -- I will go ahead and say it -- I understand that they are solving this problem or have solved it. That being the case, this would be eliminated as a source.

4) A fourth major source is the production of nitrogen oxide as a result of the internal combustion engine, primarily the automobile. A considerable amount of nitrogen oxides are produced by the reaction of nitrogen and oxide under the high temperature and pressures which occur in the internal combustion engines. When this material is exhausted out the back of the engine and becomes a component of the air and reacts with the rainfall or is absorbed by the dew or any other sources of moisture, this ultimately ends up as nitric acid, and to the extent that it is washed out down into the estuaries becomes a component of the nitrogen in the estuary.

So the question arises, in consideration of these various and sundry sources of nitrogen, whether or not the problem will be solved simply by assuming that the source that is causing the trouble is the effluents by the various plants along the estuary, and then allocating the amount that can be tolerated by the estuary among those different plants, whether or not this will solve the problem.

Looking at another aspect of it is the possibility of control. Certainly some of these sources can be eliminated; certainly others cannot be eliminated. So the question arises: If the problem is going to be solved, will it be necessary to eliminate all sources that can be eliminated because of the contributions of those sources that cannot be eliminated? And to clarify that a little bit, let me say there are some that can't be eliminated.

Number one that can't be eliminated, I think, is the effluents from private sewage disposal systems in this area. I don't see any possibility of collecting, with any kind of degree of economic feasibility, all of the sewerage from all of the homes and small operations within the county.

I don't think that we can control completely or even to any great extent the agricultural contribution of it. We have to eat. If we don't eat, we don't live. We cannot support a growing population without the use of nitrogenous and phosphatic fertilizers. Certainly some

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improvement can be made in this area by the means of applying these, by incorporating them into the soil so that the runoff is reduced. But you certainly cannot eliminate this as a source of pollution. And I might add that this is a modern thing in that the use of fertilizers has grown during the same period of time that the plants have been established.

Then, something bothers me about the discussion so far as regards the allocation of pollution among the various assumed contributors. Number one, I don't see how it is going to be possible to equitably allocate it among them. Number two, I don't see that we can let anybody put anything in if they can avoid it at all. Number three, if you allocate it among the present industries, what about the future of the area? Does this mean that we cannot have any additional industries brought into Escambia County and Santa Rosa County? What about their position? If we cannot bring in any future industries into the county, does it mean that the area is going to be not only the victim of eutrophication but also the victim of atrophication?

So I frankly state that I don't have the solution to these problems, but I think that the conference is going in the right direction in saying that now we have to start doing it; we have to start doing the things that can be done certainly. We can't wait for more studies to nit-pick as to whether we are putting in a little more than somebody else, or who is responsible for exactly how much. The problem has to be solved. But I just appear here to throw out these thoughts for whatever they may give, and in throwing out some perspective into the total problem so that we are not guilty by default of making too narrow a solution for too broad a problem.

MR. STEIN: Mr. Patton.

MR. PATTON: I would like to make a couple of comments, Mr. Chairman: One, we have had considerable discussion with farm groups and farm organizations over the period of the last several months. I think these groups have become much more aware of their part in the total pollution picture. We have not and do not intend to ignore their contributions.

For example, as a specific, they have what is called a specification of practice and they, as some of you know, support this financially if the farmers in the specified county follow these practices. One of the things that they are doing now is to move in this direction to curtail the contribution that farms are putting into our waters. Admittedly it may not be moving as fast as we like.

I don't think that, as Dr. Neth has indicated, we know all of the answers, but I think they are moving in the right direction.

Number two, the enclosure that we furnished to the conference shows a map of all treatment plants in Escambia and Santa Rosa Counties including the private treatment plants, and I can't agree that we can't do something about the private treatment plants. I think that the owners and operators of private treatment plants have a responsibility of meeting a standard just as much as the city of Pensacola or any industry does.

I am a little bit confused by his remarks and I am wondering if he is suggesting that we just say this is an insoluble problem and write off the area waters or what would he suggest that we do?

DR. NETH: I don't take that position at all. The fact that it is a broader problem than what has been discussed so far does not mean that it is not worthy of solution or it is not possible of solution. It just means that it may require a broader solution than what is being considered.

If it turns out -- and I don't have the figures to back it up, I am sorry to say -- that a major contributor to this is the automobile, then the solution will be along the lines of producing an automobile engine which does not set up the correct conditions for production of nitrogen dioxide. Certainly the smoke stacks that are putting out nitrogenous materials can be equipped to remove these materials. Absorption columns can be put in which will take out virtually 100 percent of these nitrogen compounds.

MR. STEIN: Mr. Neth, I think your comments are all to the point but, again, let me say -- looking back and forth on this panel -- I have known most of them for years. As a matter of fact, I started in this in 1949, and when I started, that fellow at the end of the table, Arthur Beck, was already working in the field.

Now, we may not be the smartest or the quickest guys in the world, but I think in all those years we have heard most of the problems set before us, and we have given a lot of thought and a lot of discussion to every one of the problems you brought up.

However, just let's look at what we are doing here. Maybe this should be made very clear. All we are doing here is operating under the regulatory provisions of two State's laws and the Federal water pollution law. We, in addition to that, know that in Florida they have an air and water agency, and Mr. Reed represents that. We also have an air program in the Federal Government. We have a research program. We are working with agriculture, and so forth. We recognize that we have to have a multi-pronged attack on the problem.

Being aware of all of the problems and aware of what you said -- and I think you have made an excellent analysis of this, because these are the things that I think we have identified as the things we have to do -- we have to make a judgment whether in dealing with the enforcement technique we have here -- and that means analyzing the problem and regulating those sources which we feel we have jurisdiction over and can regulate -- we can make a material contribution to the improvement of the water and get an action program moving now.

I think the judgment that Mr. Reed has made, and the Governor of Florida before he called us in, and I think that Secretary Hickel made before he accepted this, is that we can make that contribution through this enforcement technique. That does not mean to say for one moment that we are not thinking in terms of the implications of agricultural runoff, of automobile exhaust, and smoke stack emissions. But I again submit to you that in the enforcement technique, as you have been quick to point out, these sources are very hard to get at, and may or may not be beyond our control or jurisdiction.

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However, the notion here is that doing what we are doing here and getting at major sources may really clear up the problem.

Now, you did have a certain measure of agriculture before you had these fish kills. You had a lot of automobiles around before you had the fish kills. And, of course, where you have the septic tanks, a lot of that is kept in the ground, no runoff and doesn't get to the stream.

I think the judgment here is based on an assumption -- and you have gone beyond the assumption -- that a material improvement in the water quality can be made if we get at the municipal and industrial sources, identifiable here coming out in pipes, recognizing that we are not by this technique getting at the agricultural sources or automobiles or possibly some of the others.

Now, I think we can say that, sir, for practically every pollution program we have in the country -- and we have this whether you deal with the Great Lakes, the Pacific Northwest, or Lake Tahoe.

Now, let me just take another moment because I think in one case we have pushed this to the ultimate. One of the clearest lakes we have in the country is Lake Tahoe. That is really a glacial lake. Crater Lake, which is much smaller, and Lake Tahoe are the only two like it.

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The lake is so clear you can see down 40 feet, and not only is it reputed but it is a fact that very few people who are drowned are ever recovered there because the bubbles don't form and they just stay in the bottom and don't float up on top eventually.

In order to treat the wastes in Lake Tahoe, it was decided to give tertiary treatment to the wastes -- not the corpses -- and you know the Americans are very great, when we have a lake like that. Instead of making that into a national park and restricting it, we open it for cabin development and we build multi-structured gambling casinos along the side, and everyone does what comes naturally in those gambling casinos. They don't look at the lake, but they sure manufacture material that is discharged.

No matter how well we treated it, we found that some nutrients would get in there because the waters were so pure. So we gathered them all up and we pumped them over the divide, which was no small operation, out of the watershed into adjoining watersheds, so no effluent, treated or untreated, goes into Lake Tahoe Basin.

Now, do you think we have got the problem licked? Not completely, because there are golf courses and lawns and there is just a runoff in the street. Automobiles are

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coming in there because the guy has got to drive up to lose this money in the slot machines, and they drip oil, and they drip gasoline, and it rains, and that gradually gets in the lake.

However, I do think that by the technique that we have of getting all the effluent, treated or untreated, and all of the loose stuff in to go out, we have given Tahoe a lease on life, and we are working on the other.

Now, just one more point. I agree with you. We just have to come up with this allocation business because there is no way to have an equitable program without it. No allocation system is any good unless you have a cushion, and you can absorb new population and new industry. And this, again, is a problem, and is a problem that we have met.

Now, the alternative to that, you see, is something we find we can't meet under present conditions, and I am taking the opportunity here, because many of you have these problems which you have brought up -- years ago, when we used to move into gross pollution, we used to ask someone to reduce their waste by 50 percent. Then we asked them to reduce their waste by 80 percent. Then you can ask someone to reduce by 94 or 98. But this doesn't do the job because, say you get Podunk, with a population of 1000, and you ask them to reduce their wastes by 90 percent; you have very little volume again.

But let's again suppose you have New York City and you ask them to reduce its waste by 90 percent; the residue, that 10 percent, may be quite a load.

Well, in order to protect the streams, we find we have to put in limits on pounds per day that we are doing here. Once you get the pounds per day to protect those waters, which we have to get, and you have more than one discharger, you have to make some kind of allocation to be fair and tell each one what he can do, since we are not giving him a percentage. Once you are dividing up the pounds, you are making an allocation.

This is what water quality management is going to mean in the future. What we are going to do is have a tighter and tighter adjustment as areas grow, and the percentage that everyone is going to take out is going to be more and more as the years go along, because Escambia Bay presumably can't take any more nutrients than the limits, than the people here have outlined, and we just have to find ways to reduce it.

Now, again, let me assure you -- the investigators, the people on the panel, the agencies we represent have thought about all the problems you are going to have.

We recognize that the kind of jurisdiction we are exercising in the enforcement conference just meets a fraction of those problems. However, the judgment is that this is going to be significant to control the pollution. We hope, for example -- I think our investigators would say: If you put this through, the program they have outlined, the fish kills would stop and your fish life will be restored in Escambia Bay. And that is no small accomplishment.

DR. NETH: If that is accomplished, I think that the job has been well done. The main question that I was raising was whether with this kind of allocation or not we have a real pertinent chance of stopping it.

MR. STEIN: They think so.

DR. NETH: If that be the case then I say more power, but if it isn't, then we obviously have to not put anything into it. That is the limit.

MR. STEIN: Well, I don't know.

Now, again, let me give you this: We can only move as best we have moved on the problems in the past. Now, I hope you bear with us here because very often this gross pollution is a kind of thing that has other problems.

Escambia isn't new. You heard the chemical companies -- American Cyanamid outline its program;

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Container Corporation had a program -- we were here before -- Alabama has a program; Florida has a program. During the fifties we came up with a program for putting in waste facilities. You heard American Cyanamid, I think, give a more detailed explanation of the program. I would not doubt in the least that they proceeded in a bona fide manner and did their surveys, and everyone who believed it and checked it out believed that they weren't making a substantial contribution here. We all did this in the fifties.

The most we were asking for was secondary treatment. We never gave a thought to nutrients or phosphates or carbon or phosphorus. That wasn't even on our mind. We thought we were doing the best. This treatment wasn't lost, however.

What I am trying to say is that, in the late sixties, or in the seventies, we have identified a part of a problem which we never even thought of in the forties, or in the fities, or in the thirties, and what I am suggesting to you now is: even if we move to this cleanup, we may run into other problems. But I am willing to make a bet with you that the problem won't be the projections of what we think they are -- and I think they are the same as you said, automobiles, exhausts, agricultural runoff, or something like that -- I bet it will be something that you or I have never even thought of. But you can't stop. The point is: we have to move ahead with the program and for now our investigators think they have an answer.

MR. REED: Mr. Stein, I might also mention that in the years to come there will be methods of treatment undreamed of now. But unless we make that first step; unless we make that first step, assuredly Escambia Bay will remain very, very dead.

But I appreciated your remarks as well. I would like to reiterate what Mr. Patton said. I guarantee you our board has spent hours thinking about agricultural runoff. We have some examples downstate that are very vivid in our minds and I can assure you we have thought with the problem long and hard and aren't going to forget it.

Thank you.

DR. NETH: Thank you.

MR. STEIN: Mr. Patton.

MR. PATTON: Mr. Chairman, we have one other person, Dr. Reid H. Leonard, Consulting and Analytical Chemist, Pensacola, Florida, who has indicated he wanted to be heard.

Dr. Leonard.

STATEMENT OF REID H. LEONARD, Ph.D.,
CONSULTING AND ANALYTICAL CHEMIST,
PENSACOLA, FLORIDA

DR. LEONARD: Mr. Chairman, ladies and gentlemen, this will be quite brief.

Since October and the interest in nitrogen, I became interested in rainfall, and I will give a report here -- very short.

I have been able to collect 18 rain samples, and this is a difficult thing to work out, but the average nitrate nitrogen was .43 parts per million or milligrams per liter. But I did not have a rain gauge, and this requires a little more qualification.

The lowest sample was the tail end of approximately a 3-inch rain, which showed a figure of .01; and the highest sample was a little drizzle one day with 2.8 parts per million nitrogen.

And then along with that, I left a Brandt line rather close to Carpenter's Creek, so I have obtained twelve samples from the creek. The average was .56. Again, this is nitrate nitrogen. There is a trace of nitrite in rain water and in creek water, and a little trace of ammonia, but this is insigificant. The range on the creek is running between .37 and .75. The .37 relates with the good 3-inch rainfall.

Then, also I became curious -- this is simply my curiosity -- about the nature of the drainage from this street. We have been able to get four samples so far, the average of which is .43. The range was from .12 to .58. Again, the .12 is with a heavy 3-inch rain.

This is all I would like to offer here. This is just for information.

MR. STEIN: Any comments or questions?

If not, thank you very much.

MR. PATTON: Mr. Chairman, I have a letter here from Mrs. Charles F. Smith, Jr., and she asked that this be introduced into the record.

MR. STEIN: Without objection, it will be entered into the record.

STATEMENT OF MRS. CHARLES F. SMITH, JR.,
ROUTE 4, BOX 57, PENSACOLA, FLORIDA

MRS. SMITH: I live at Devil's Point in the west side of Escambia Bay and would like to put into the record of this conference my experience with the water in this area.

As a life-long resident of Pensacola, the changes that have occurred distress me greatly. No fish, crabs, shellfish, or birds can be seen regularly. The water is filthy. If the depth is greater than two and a half to three feet, the bottom is not visible from our dock. The bottom is coated with a loose black sediment.

The latter part of the summer my children had to stop swimming. They were caught one time in effluent which I knew was raw sewage. On repeated occasions when the wind is out of the southeast and the tide incoming, evidence that the treatment plant is dumping is very noticeable. Foam and solid substances are readily visible floating throughout the top layers of the water.

Attempts to get the State Health Department to analyze the water for bacteria, typhoid, and/or harmful ingredients have been fruitless. They see no need! It takes too long!

But, when an oily film appears on the water, washes up on the beaches and settles in the sand, and when my children are covered with fecal material, I feel the time has come to do something.

MR. PATTON: Are there any of those who indicated they wanted to speak who were not present when their names were called and now are present and wish to speak?

MR. REED: Mr. Chairman, we will pass on, then, and that concludes the Florida representation.

MR. STEIN: Thank you.

We will now call on Alabama, Dr. Myers.

DR. MYERS: Mr. Chairman, I want to introduce the members of our technical staff of the Water Improvement Commission of Alabama: Mr. J. L. Crockett, Mr. John Bolton, Mr. Pat Langa, Mr. John Williford. I would like for them to stand and be recognized, if they will.

These are in addition to Mr. Beck, who is the Technical Secretary to the Commission, and is here at my left.

To make the presentation for the Alabama Water Improvement Commission, I would like to call on Mr. Crockett, the Director of the Technical Staff of the Alabama Water Improvement Commission.

STATEMENT OF J. L. CROCKETT, JR.,
DIRECTOR OF THE TECHNICAL STAFF,
ALABAMA WATER IMPROVEMENT COMMISSION,
MONTGOMERY, ALABAMA

MR. CROCKETT: Mr. Chairman and conferees, I am J. L. Crockett, Jr., Director of the Technical Staff of the Alabama Water Improvement Commission.

Mr. Bolton is passing a statement among you which had been prepared. I am going to abbreviate this statement wherever I can. There are one or two points that I would like to add, but for the sake of time, I will try to get through as quickly as possible.

DR. MYERS: Mr. Chairman, we would like to introduce the full report into the record.

MR. STEIN: That will be done.

I will ask the reporter to get the parts that Mr. Crocket expands. Let's not miss those.

(The document referred to above follows.)

STATEMENT PRESENTED TO THE CONFERENCE ON INTERSTATE POLLUTION OF THE ESCAMBIA RIVER AND BAY (ALABAMA - FLORIDA) ON BEHALF OF THE ALABAMA WATER IMPROVEMENT COMMISSION,

GULF BREEZE, FLORIDA,
JANUARY 20, 1970

The drainage basin of the Conecuh River covers approximately 3,930 square miles in 10 Alabama counties and reaches to within 30 miles of Montgomery. For the most part, the drainage basin is rural in nature with relatively few industries located in the area. Only those waste sources in Alabama from Brewton to the Alabama-Florida state line can be remotely considered to affect the quality of Florida waters. Within this area are three municipalities, two of which provide secondary treatment for their sanitary wastes. Municipalities providing adequate secondary treatment are Brewton and Flomaton which discharge 500,000 and 130,000 gallons daily at points 10 miles and 1 mile, respectively, from the state line. The third municipality, East Brewton, discharges 160,000 gallons daily untreated to Murder Creek, a tributary to the Conecuh River, at a point approximately 12 miles from the state line. The Commission has ordered East Brewton to provide secondary treatment of its waste but the municipality has made little progress in this direction. Atmore Prison, a state institution, discharges 120,000 gallons daily from a secondary facility to Wet Weather Branch at a point 18 miles from the state line.

From an industrial standpoint, waste sources include sand and gravel washers, wood preserving operations, an oil field and a pulp and paper mill. Current records reveal 18 active sand and gravel washers located on Little Escambia and Big Escambia Creeks. In the past, these operations have resulted in the discharge of turbid water. The Commission has made a concerted effort to regulate the operation of these industries and an inspection on January 13, 1970, revealed that all such operations located in Alabama were either recycling their wastes or providing adequate sedimentation facilities.

There are currently approximately 30 oil wells operating in the Pollard Field of Escambia County, Alabama. All of these installations are injecting brine wastes into oil-bearing formations without contributing to water pollution. Operations of these wells are routinely checked and monitoring of streams draining the Pollard Field performed by the State Oil and Gas Board in cooperation with the Commission. We have asked Mr. H. G. White, Chief Petroleum Engineer of the Oil and Gas Board, to present a statement to this conference for the purpose of acquainting those present with measures taken to prevent water pollution.

Wastes from T. R. Miller Mill Company's wood preserving operations in Brewton are being satisfactorily controlled and measures employed by the company are considered adequate.

Container Corporation of America's pulp and paper mill at Brewton is by far the largest industry within the Conecuh River Basin. The mill is located on a 5,000-acre site approximately 4 miles southwest of Brewton between U. S. Highway 31 and the Conecuh River. A large percentage of the plant acreage lying near the Conecuh River is a practically flat swamp subject to flooding by the river. Within this swamp are six natural lakes which are used as final oxidation ponds in the mill's waste treatment system and were an influencing factor in selection of the mill site.

The mill commenced operation in 1957 with an initial production of 345 tons per day of bleached paper board used in the manufacture of containers for a multitude of food products. Waste treatment facilities at that time consisted of two earthern settlings for the removal of suspended solids followed by passage of the wastes through the series of four natural lakes located on the mill property.

Since initial operation of the mill, production has increased from 345 tons per day to approximately 900 tons per day. Additions and improvements to the waste water treatment system have paralleled the expansion in conformance to requirements of the Alabama Water Improvement Commission. Treatment facilities in operation as of this date may be briefly described as follows:

Manufacturing operations utilize 36 million gallons daily, half of which is used in pulping and papermaking with the remainder used in pulp bleaching and for general purposes. Wastes from pulping and papermaking flow to a clarifier, a concrete tank 295 feet in diameter, for removal of fibre and other suspended material. Settled wastes from the clarifier flow to a biological waste stabilization basin, 150 acres in area and with a volume sufficient to retain the daily flow for at least seven days. Liquid oxygen is introduced into the pipe carrying settled wastes from the clarifier to the stabilization basin at the rate of 2,500 pounds daily. Two mechanical aerators, each rated at ~~20~~ 40 horsepower, are situated in the lower portion of the basin. Biologically treated wastes from the stabilization basin join the 18 million gallons daily of bleachery wastes, which have a low organic content, and the flow of Franklin Mill Creek before entering a series of six natural lakes which provide five days' retention before the wastes enter the Conecuh River at a point approximately 2.5 miles above the state line. The contribution of flow by Franklin Mill Creek to the waste retention system during dry weather conditions has been estimated to be 5 mgd. There are also small, but undetermined, contributions to this system by other natural streams. The quantity of discharge from the overall waste treatment system to the Conecuh River is not measured and therefore unknown. Container has estimated this flow to be 36 mgd, a figure that is subject to question. On the basis of analyses of 26 samples by Container during the period June 1- September 21, 1969, the B.O.D. of the company's discharge to the Conecuh River averaged 31 ppm. Using Container's estimated discharge of 36 mgd, the discharge of B.O.D. over the above period averaged 9,300 pounds daily. According to information furnished by Container, the company generates an average of ~~40,000~~ 56,800 pounds of B.O.D. daily before treatment. Using this figure and the quantity of

B.O.D. in the discharge to the river, Container's overall treatment system accomplished a B.O.D. reduction of ~~81~~ 83.6 percent during the period June 1 - September 21, 1969. This degree of reduction must be qualified because of the unknown quantity of flow represented by the discharge.

Improvements in treatment facilities over those originally installed include substitution of a mechanical clarifier for earthen settling basins and construction of the 150-acre stabilization basin in 1964, addition of two natural lakes for retention of treated wastes in September, 1968, introduction of liquid oxygen into the clarifier effluent in May, 1969, and installation of two aerators in the stabilization basin in July, 1969.

Container is currently operating under a permit issued by the Commission on June 24, 1965, incorporating conditions agreed upon by the Commission and the Florida State Board of Health. The original permit issued by the Commission to Container on July 3, 1957, also contained conditions requested by the Florida State Board of Health. As a matter of interest, the conditions to be imposed on Container and treatment facilities to be installed by the company were set only after conferences between representatives of the Commission and the Florida State Board of Health.

The waste discharge permit issued to Container by the Commission is valid without respect to time and is revokable only if Container violates the conditions of the permit or water quality standards adopted by the Commission.

One of the conditions of the permit held by Container requires the company to monitor its waste treatment system and the receiving stream in a manner acceptable to the Commission with reports to be submitted routinely to the Commission. The minimum stream sampling schedule acceptable to the Commission is three days weekly during the period April 15 to November 15. Container began its stream monitoring program in 1959 and has progressively increased its activities in following years. During 1968, Container sampled the Escambia River at Florida State Highway 4 near

Century on 145 days. In 1969 the company sampled the Escambia River at Florida State Highway 4 near Century on 96 days. Some indication of the thoroughness of the company's monitoring program is demonstrated by the fact that in 1969 alone 4,888 measurements and determinations were made in connection with its effluent monitoring and river sampling program. As a part of its monitoring program, Container retains the Institute of Paper Chemistry as a consultant on stream biology. Beginning with 1957, the Institute has performed biological studies of the Conecuh-Escambia River annually with reports of these studies being filed with the Commission.

In addition to the monitoring program of Container, the Escambia River has been studied extensively by the Florida State Board of Health, during 1958 (jointly with the Commission), 1963, 1966 and 1968. For a considerable period, beginning in 1960, a National Water Quality Station was operated at Century cooperatively by the Florida State Board of Health and the U. S. Public Health Service. At the request of the Commission, the Federal Water Pollution Control Administration performed water quality studies of principal streams in the Conecuh River Basin of Alabama and Escambia River in Florida during the period April 24 to June 28, 1968. This Federal agency also performed a biological study of the Conecuh River and its tributaries immediately upstream from the state line and the Escambia River near Century, Florida, during the period September 28 to October 2, 1968. At the request of the Florida Department of Air and Water Pollution Control, the Federal Water Pollution Control Administration installed and operated a water quality monitor in the Escambia River at Florida Highway 4 near Century in July, 1969. Results recorded by this monitor during the period July 7 to September 15, 1969, have been provided the Commission.

At the request of the Florida State Board of Health, the Department of Health, Education and Welfare held a conference, under provisions of the Federal Water Pollution Control Act, in Pensacola on October 24, 1962, on interstate pollution of the Conecuh-Escambia River system. In substance, this conference concluded that alleged pollution discharged by Alabama sources was not affecting the health and welfare of Florida residents. During the fall of 1966, the Federal Water Pollution Control Administration conducted an investigation of complaints received by the agency from citizens of Florida regarding effects of pollution on fish in the Escambia River. Excerpts from the summary of this report (Investigations of Complaints Concerning the Conecuh-Escambia River, by W. T. Donaldson and J. H. Gakstatter, December, 1966) should be of interest to this conference. "Investigation of complaints from Florida fishermen concerning the Conecuh-Escambia River revealed that fish in the river are not being seriously harmed by industrial outfalls in the area of Brewton, Alabama."...."There is no substantial evidence of a decline in fish population; problems of slime odor and taste of fish are minor; and the darker color of the water apparently has little adverse effect."....

With exception of one sample, collected by Container on July 10, 1968, which revealed a dissolved oxygen concentration of 3.8 parts per million in the Escambia River near Century, none of the studies, investigations or the Federal conference mentioned above have revealed or defined conditions in the Escambia River attributable to sources of wastes from Alabama below those permitted by duly adopted water quality standards.

Although we are pleased that Alabama has been able to control its wastes to the Conecuh River to the extent that water quality standards have been met, even during the critically low flows of 1968 when the record low over a period of 34 years occurred, we are concerned over aesthetic effects of color introduced in the Conecuh and Escambia Rivers by wastes from Container. This condition became quite apparent in 1966 and was first called to our attention by Container and was, in turn, reported by us to the Florida State Board of Health and the Federal Water Pollution Control Administration. Color of pulp and paper mill wastes has been recognized, for many years,as a problem and considerable effort and financial resources have been expended in researching methods by which this color might be reduced. At the present, the Federal Water Pollution Control Administration is funding three research and development projects for the purpose of developing an economically practicable method for reduction of color in pulp and paper mill wastes. We have advised Container that reduction of color will be required when an economically feasible method of doing so is developed.

Container has, throughout its existence in Alabama, cooperated with the Commission to the fullest degree. The company has been responsive to recommendations of the Commission's staff and has freely furnished information on its operations over and beyond that considered to be required submittals. Container has also opened its doors to representatives of water pollution control agencies of Florida and the Federal Water Pollution Control Administration, cooperating with the agency during its investigations and studies and supplying information on its waste control operations. With the advent of low flows and marginal water quality conditions in the Conecuh-Escambia River, the company took emergency action by supplementing its waste retention capability and, at the same time, called in its engineering consultant for advice on measures it should take in the event of continuation of low stream flows or more severe flow conditions than experienced. Two mechanical aerators were installed in the stabilization basin in July, 1969, for the purpose of insuring that water quality standards were met as required. These actions were taken by the company before the Commission was advised they were being considered. In connection with a proposed 150 tons per day expansion in pulping capacity, the company has under construction a new basin with a capacity of 52 million gallons which will be equipped with 13 mechanical aerators having a total of 975 horsepower. The total amount of B.O.D. generated as a result of the proposed production increase would be raised from the present level of ~~48,000~~ 56,800 pounds per day to approximately ~~54,000~~ 63,000 pounds per day. While some delay has been experienced with delivery of electrical equipment, it is anticipated that this addition to the treatment facility will be completed in midsummer of this year.

The Federal report upon which is the basis for discussion at this conference was not received by the Water Improvement Commission until last Thursday, January 15, 1970. Two staff members of FWPCA visited Montgomery on December 30 with a copy of a preliminary draft at which time a reproduction of the report's conclusions and recommendations was made. It was emphasized at the time that the entire report was preliminary and subject to revision. Certainly all would agree that there has not been sufficient time permitted for Alabama, Florida, as well as others involved in this matter to review and intelligently comment on the findings of the report.

The fact that insufficient time was provided to permit an adequate review of the report has particular significance as the report injects a new, and perhaps controversial, dimension, that of carbonaceous material, as a major influence in eutrophication of Escambia Bay. This conclusion is of concern to Alabama because the report alleges that carbonaceous materials from a source in Alabama is contributing to eutrophication of the Bay. Furthermore, the contribution of carbonaceous materials to Escambia Bay from this source in Alabama has been calculated from a theoretical textbook equation, not on measured conditions existing in the Conecuh-Escambia Rivers. This approach has been taken even though a wealth of Alabama, Florida and FWPCA stream data are available.

We take no issue with the conclusions of the Federal report as to the cause of the problem existing in Escambia Bay but with the association of a source in Alabama already providing a reasonable degree of treatment and located over 50 stream miles from the mouth of the Escambia River with this problem.

Let me repeat that we have not been afforded ample opportunity to study the Federal report and consequently our comments must be limited. There are, however, several statements and inferences appearing in the conclusions and recommendations that may not be readily understood by all present. In addition, we question whether certain recommendations can actually be attained with present technology.

In the section of the report entitled "Conclusions and Recommendations" appears a table containing allowable waste effluent expressed in pounds per day. From this table and taking into account the quantity of B.O.D. discharged by Container theoretically stabilized in the Conecuh-Escambia Rivers, a permissible B.O.D. load on Escambia Bay of 1634 pounds per day from all sources may be calculated. While it is not clearly stated in the report, the conferees should keep in mind that the quantities of carbonaceous material, total organic carbon and other materials listed in the aforementioned table, represent recommended maximum quantities that can ever be discharged to Escambia Bay. In other words, after reaching the recommended degrees of treatment included in the report, no further increases of pollutional materials could ever be discharged by present users of the stream and no future use could be made of the stream that would increase the discharge of quantities of materials listed in the table into Escambia Bay. We submit that while such levels are desirable, they are not now attainable with present treatment technology.

We have been advised by FWPCA personnel engaged in the study leading to preparation of the report that only six samples were taken of the effluent from the Container Corporation's treatment system. The results of these six samples, which averaged 25 ppm, were used to calculate the quantity of B.O.D. discharged by the Company during the FWPCA study. The period of sampling by FWPCA followed a two weeks' shutdown by Container which probably explains the lower B.O.D. concentration found by FWPCA as compared to that reported by Container from June 1 - September 21, 1969. The significance of the difference in B.O.D. concentrations determined by FWPCA and Container lies in the fact that FWPCA apparently used their concentration and 80 percent B.O.D. removal through Container's waste treatment system to determine the output of B.O.D. by Container before treatment and, in turn, reduced this figure by 94 percent to arrive at the allowable contribution of B.O.D. by Container to the Conecuh River. As previously stated, the production of B.O.D. by Container, measured over a long term, is ~~48,000~~ 56,800 pounds daily, a figure contained in an engineering report submitted to the Commission by Container during October, 1969. If Container is held to the allowable limit of 2,230 pounds of B.O.D. daily discharge recommended by FWPCA, the company must reduce the amount of B.O.D. now produced by ~~95.4~~ 96 percent. With completion of the 150 ton per day expansion presently under consideration by the company, waste treatment efficiency to the degree of ~~95.9~~ 96.4 percent B.O.D. removal would be required to comply with FWPCA's allowable load.

A requirement that Container reduce its B.O.D. by 94 to 96 percent merits consideration by the conferees. Our experience with treatment of pulp and paper mill waste is that removal of B.O.D. consistently in excess of 85 percent cannot be attained except at sites where land and topographic features permit long term storage in oxidation ponds with retention periods of up to six months. There are several pulp and paper mills in Alabama with secondary treatment facilities, all of which submit operational data to the Commission. We would be happy to review these data with representatives of FWPCA to demonstrate that B.O.D. removal to the extent recommended by FWPCA cannot be attained consistently with present technology except at sites where large land areas suitable for long term impoundment exist.

The voluminous data on water quality on the Escambia River neither indicates nor suggests that Container is contributing B.O.D. to Escambia Bay. A review of B.O.D. data for the Conecuh River above Container's discharge and for the Escambia River below Florida Highway 4 near Century will support this contention. Any association of Container with contribution of B.O.D. to Escambia River must be on a hypothetical basis which does not justify the conclusions and recommendations in the FWPCA report.

The recommendation that "Color in the Escambia River at the Alabama-Florida state line as measured at the Highway 4 bridge near Century, Florida, (be) reduced to background levels measured above the Container Corporation of America discharge" does not accurately reflect the standards of Alabama and Florida pertaining to color. Both states permit the addition of color to the extent that it will not unreasonably affect the aesthetic value or be injurious to aquatic life in the case of Alabama or it will not create a nuisance in the case of Florida. We have previously acknowledged that a color problem does exist at and immediately below the state line and have stated that Container will be required to reduce the color in its waste when an economically practicable method for doing so is developed.

Summarizing our position, we do not disagree with the finding that water quality has deteriorated in Escambia Bay. This is not surprising in in view of the low quality of water existing in the lower Escambia River over the past 10 or more years. This condition was first documented in a joint study conducted by the Commission and Florida State Board of Health in August, 1958. We are not convinced that sources of waste within Alabama are contributing to this condition and consider the conclusions and recommendations appearing in FWPCA's report relative to degree of removal of B.O.D. by Container Corporation to be unfounded and unrealistic. We submit that Container's pollution control program, supplemented by improvements underway, will adequately protect the waters of the Conecuh-Escambia River system and conform to standards of water quality with the exception of color. We have stated that Container will be required to reduce the color of its waste at such time as research and demonstration projects, presently in progress with Federal support, reveal practicable solutions to this problem. We are quite concerned over the inference in the FWPCA report that further increases in existing or new discharges of B.O.D. to Escambia Bay cannot be permitted. If this be the case, growth and development along the Escambia River and Bay and perhaps the lower Conecuh River may well come to a halt.

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MR. CROCKETT: The Federal report presented to this conference did not mention municipalities in Alabama, but I think that the U. S. conferees would be interested in knowing what these municipalities are doing.

The area under consideration in Alabama extends from Brewton to the State line, and within this area are three municipalities, two of which provide secondary treatment for their wastes. These include Brewton and Flomaton. Brewton discharges approximately 500,000 gallons a day, and Flomaton 130,000 gallons daily at points 10 miles and 1 mile, respectively, from the State line. The Flomaton treatment system was placed in operation some 2 or 3 months ago.

The third municipality, East Brewton, discharges approximately 160,000 gallons daily untreated to Murder Creek, a tributary to the Conecuh River at a point approxiimately 12 miles from the State line.

The Commission has ordered East Brewton to provide secondary treatment of its wastes, but the municipality has made little progress in this direction. We recommend to the conferees that they take a position with respect to treatment of wastes by East Brewton.

Atmore Prison, a State institution, discharges approximately 120,000 gallons daily from a secondary facility to Wet Weather Branch at a point 18 miles from the State line. From the industrial point of view, waste sources in Alabama contributory to the river system under consideration include sand and gravel washers a wood preserving operation, an oil field, and a pulp and paper mill. Current records reveal 18 active sand and gravel washers, located on Little and Big Escambia Creeks. In the past, these operations have resulted in the discharge of turbid water. The Commission has made a concerted effort to regulate the operation of these industries and an inspection on January 13, 1970, revealed that all such operations located in Alabama were either recycling their wastes or providing adequate sedimentation facilities.

There are currently approximately 30 oil wells operating in the Pollard Field of Escambia County, Alabama. All of these installations are injecting brine wastes into oil-bearing formations without contributing to surface water pollution.

MR. STEIN: Joe, may I interrupt?

Is that reinjection going in as a flushing operation or into a strata that doesn't push the oil up, do you know?

MR. CROCKETT: We have with us today Mr. H. G. White, Chief Petroleum Engineer of the Alabama Oil and Gas

Board who will make a very short statment, and will discuss these injections with you, which I believe will answer your question.

MR. STEIN: In view of the statement we had before about underground injection I think this is pertinent in which strata it is going into.

MR. CROCKETT: Yes, I heard that statement.

As some of you know, the FWPCA is now sponsoring research and development projects for injection of wastes in underground --

MR. THOMAN: May I say, sir, that at 6:00 p.m. on Saturday evening that the Commissioner of the FWPCA stated that he had instructed the Assistant Commissioner for Research and Development to terminate that grant at an early date?

MR. CROCKETT: Sorry to hear that.

MR. THOMAN: So am I but --

MR. STEIN: If it will make you feel any better, not that you fellows don't know this, but these oil breaks used to roll over the ground and into the stream and kill everything there and I was on the forefront to push that cleanup in those days to get the injection systems put underground.

MR. BECK: That is about all you can do with them.

MR. STEIN: I don't know that it has caught up with us, but again -- you don't mind if we just take --

MR. CROCKETT: Not at all.

MR. STEIN: -- a second.

Some of you may know this. Let me give you the situation that fellows like Arthur Beck and I faced when we came into the field maybe 20 years ago. What you did, if you didn't have a free-flowing well, particularly in the South, you get a well where salt brine would come up with the oil. You would use a crude separator involving heat. Oil would rise to the top of the separator, flow into a collecting system, and then to the refinery. The brine waste was dumped on the ground killing every bit of vegetation. As it flowed over the ground, the vegetation would turn gray. Trees were killed; the grass was killed. The brine would then find its way to the nearest stream, and because of the added materials it carried it would kill everything in its path. The materials would finally precipitate out of the water, and streams became so clear you could read the writing on a dime on the bottom. The clear streams were absolutely sterile -- absolutely nothing alive; no fish, no mayflies -- you couldn't find a living thing in those streams. By the way, this was true throughout all of the Southwest, particularly in Oklahoma and Texas. A campaign was started to have the oil companies and the oilfields gather their wastes and return them to underground strata.

Now, there are two kinds of underground operations there: 1) where brines are pumped underground to dispose of them; and, 2) where the brines are pumped back into the oil-producing stratum to increase oil production through water flooding. The oil being lighter than water rises to the top of the stratum and pumping oil from the field can be increased. Then you can continue economically pumping that field.

I was asking where this brine would go, because obviously if it got into this oil dome, you are never going to use an oil dome as a source of drinking water. But let's go on, gentlemen.

MR. CROCKETT: Wastes from T. R. Miller Mill Company's wood preserving operations in Brewton, Alabama, are being satisfactorily controlled, and measures employed by the company are considered adequate.

Container Corporation of America's pulp and paper mill at Brewton is by far the largest industry within the Conecuh River Basin of Alabama. The mill is located on a 5000-acre site approximately 4 miles southwest of Brewton between U. S. Highway 31 and the Conecuh River. A large percentage of the plant acreage lying near the Conecuh River is a practically flat swamp subject to flooding by the river. Within this swamp are six natural lakes which are used as final oxidation ponds in the mill's waste treatment system and were an influencing factor in selection of the mill site.

Since initial operation of the mill, beginning in 1957, production has increased from 345 tons per day to approximately 900 tons per day. Additions and improvements to the waste treatment since then have paralleled the expansion in conformance with the requirements of the Alabama Water Improvement Commission. Treatment facilities in operation as of this date may be briefly described as follows:

Manufacturing operations utilize approximately 36 million gallons daily, half of which is used in pulping and papermaking with the remainder used in pulp bleaching and for general purposes. Wastes from pulping and papermaking flow to a clarifier, a concrete tank some 295 feet in diameter, for removal of fiber and other suspended material. Settled wastes from this clarifier flow to a biological waste stabilization basin 150 acres in area with a volume sufficient to retain the daily flow for at least seven days.

Liquid oxygen is introduced into the pipe carrying settled wastes from the clarifier to the stabilization basin at the rate of 2,500 pounds daily. Two mechanical aerators each rated at 40 horsepower, are situated in the lower portion of the basin. Biologically treated wastes from the stabilization basin join the 18 million gallons daily of bleachery wastes, which have a low organic content, and the flow of Franklin Mill Creek before entering a series of six natural lakes which provide five days' retention before the wastes enter the Conecuh River at a point approximately 2.5 miles above the State line.

The contribution of flow by Franklin Mill Creek to the waste retention system during dry weather conditions has been estimated to be 5 million gallons per day. There are also small, but undetermined, contributions to this system by other natural streams. The quantity of discharge from the overall waste treatment system to the Conecuh River is not measured and therefore unknown except by the estimates which have been made. Container has estimated this flow to be 36 million gallons per day, a figure that is subject to question because of the unmeasured outflow.

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On the basis of analyses of 26 samples by Container during the period June 1-September 21, 1969, the BOD of the company's discharge to the Conecuh River averaged 31 parts per million. Using Container's estimated discharge of 36 million gallons per day, the discharge of BOD over the above period averaged 9,300 pounds daily. According to information furnished by Container recently, the company generates an average of 56,800 pounds of BOD daily before treatment. Using this figure and the quantity of BOD in the discharge to the river, Container's overall treatment system accomplished a BOD reduction of 83.6 percent during the period June 1-September 21, 1969. Again, this degree of reduction must be qualified because of the unknown quantity of flow represented by the discharge.

I would say, however, that the contribution of the natural streams that I have previously mentioned would be small.

Improvements in treatment facilities over those originally installed include substitution of a mechanical clarifier for earthen settling basins and construction of the 150-acre stabilization in 1964, addition of two natural lakes for retention of treated wastes in September 1968, introduction of liquid oxygen into the clarifier effluent in May 1969, and installation of two aerators in the stabilization basin in July 1969.

Container is currently operating under a permit issued by the Commission on June 24, 1965, incorporating conditions agreed upon by the Commission and the Florida State Board of Health. The original permit issued by the Commission to Container on July 3, 1957, also contained conditions requested by the Florida State Board of Health. As a matter of interest, the conditions to be imposed on Container and treatment facilities to be installed by the company were set only after conferences between representatives of the Commission and the Florida State Board of Health.

The waste discharge permit issued to Container by the Commission is valid without respect to time and is revokable only if Container violates the conditions of the permit or water quality standards adopted by the Commission.

One of the conditions of the permit held by Container requires the company to monitor its waste treatment system and the receiving stream in a manner acceptable to the Commission with reports to be submitted routinely to the Commission. The minimum stream sampling schedule acceptable to the Commission is three days weekly during the period April 15 to November 15. Container began its stream monitoring program in 1959 and has progressively increased its activities in following years. During 1968, Container sampled the Escambia River at Florida State Highway 4 near Century on 145 days. In 1969, the company sampled the Escambia River at Florida State Highway 4 near Century on 96 days.

Some indication of the thoroughness of the company's monitoring program is demonstrated by the fact that in 1969 alone 4,888 measurements and determinations were made in connection with its effluent monitoring and river sampling program. As a part of its monitoring program, Container retains the Institute of Paper Chemistry as a consultant on stream biology. Beginning with 1957, the Institute has performed biological studies of the Conecuh-Escambia River annually with reports of these studies being filed with the Commission.

In addition to the monitoring program of Container, the Escambia River has been studied extensively by the Florida State Board of Health during 1958, jointly with the Commission, and in 1963, 1966 and 1968. For a considerable period, beginning in 1960, a National Water Quality Station was operated at Century cooperatively by the Florida State Board of Health and the U. S. Public Health Service. At the request of the Commission, the

Federal Water Pollution Control Administration performed water quality studies of principal streams in the Conecuh River Basin of Alabama and the Escambia River in Florida during the period April 24 to June 28, 1968. This Federal agency also performed a biological study of the Conecuh River and its tributaries immediately upstream from the State line, and the Escambia River near Century, Florida, during the period September 28 to October 2, 1968. At the request of the Florida Department of Air and Water Pollution Control, the Federal Water Pollution Control Administration installed and operated a water quality monitor in the Escambia River at Florida Highway 4 near Century in July 1969. Results recorded by this monitor during the period July 7 to September 15, 1969, have been provided the Commission.

With the exception of one sample, that collected by Container on July 10, 1968, which revealed a dissolved oxygen concentration of 3.8 parts per million (or milligrams per liter) in the Escambia River at Century, none of the studies mentioned above have revealed conditions in the Escambia River attributable to waste sources in Alabama below those permitted by duly adopted water quality standards.

Although we are pleased that Alabama has been able to control its wastes to the Conecuh River to the extent that water quality standards have been met, even during the critically low flows of 1968 when the record low over a period of 34 years occurred, we are concerned over aesthetic effects of color introduced in the Conecuh and Escambia Rivers by wastes from Container. This condition became quite apparent in 1966 and was first called to our attention by Container and was, in turn, reported by us to the Florida State Board of Health and the Federal Water Pollution Control Administration. Color of pulp and paper mill wastes has been recognized for many years as a problem, and considerable effort and financial resources have been expended in researching methods by which this color might be reduced. At the present, the Federal Water Pollution Control Administration is funding three research and development projects for the purpose of developing an economically practicable method for reduction of color in pulp and paper mill wastes. We have advised Container that reduction of color will be required when an economically feasible method of doing so is developed.

Container has, throughout its existence in Alabama, cooperated with the Commission to the fullest degree. The company has been responsive to recommendations of the Commission's staff and has freely furnished information on its operations over and beyond that considered to be required submittals. Container has also opened its doors to representatives of water pollution control agencies of Florida and the Federal Water Pollution Control Administration, cooperating with the agency during its investigations and studies and supplying information on its waste control operations.

With the advent of low flows and marginal water quality conditions in the Conecuh-Escambia River during 1968, the company took emergency action by supplementing its waste retention capability and, at the same time, called in the engineering consultant for advice on measures it should take in the event of continuation of low stream flows or more severe flow conditions than experienced.

Two mechanical aerators, which I mentioned previously, were installed in the stabilization basin in July 1969 for the purpose of insuring that water quality standards were met as required.

In connection with a proposed 150 tons per day expansion in pulping capacity, the company has under construction a new basin with a capacity of 52 million gallons which will be equipped with 13 mechanical aerators having a total of 975 horsepower. The total amount of BOD generated as a result of the proposed production increase would be raised from the present level of 56,800 pounds per day to approximately 63,000 pounds per day. While some delay has been experienced with delivery of electrical equipment, it is anticipated that this addition to the treatment facility will be completed in mid-summer of this year.

As several have said today, the Federal report, which is the basis for discussion at this conference, was not received by us until last Thursday, January 15, 1970. We had received the reproduction of the conclusions and recommendations on December 30, and the representatives of FWPCA emphasized, at that time, that the entire report was preliminary and subject to revision. As many have said, there has not been sufficient time for a truly concentrated study of this report.

The fact that insufficient time was provided to permit an adequate review of the report has particular significance as the report injects a new and perhaps controversial dimension, that of carbonaceous material, as a major influence in eutrophication of Escambia Bay. This conclusion is of concern to Alabama because the report alleges that carbonaceous materials from a source in Alabama has been calculated from a theoretical textbook equation, not on measured conditions existing in the Conecuh-Escambia Rivers. This appraoch has been taken even though a wealth of Alabama, Florida, and FWPCA stream data are available.

We take no issue with the conclusions of the Federal report as to the cause of the problem existing in Escambia Bay but with the association of a source in Alabama already providing a reasonable degree of treatment and located over 50 stream miles from the mouth of the Escambia River with this problem.

In the section of the report entitled "Conclusions and Recommendations," appears a table containing allowable waste effluent discharges expressed in pounds per day. From this table, and taking into account the quantity of BOD discharged by Container theoretically stabilized in the Conecuh-Escambia Rivers, a permissible BOD load on Escambia Bay of 1634 pounds per day from all sources may be calculated. While it is not clearly stated in the report, the conferees should keep in mind that the quantities of carbonaceous material, total organic carbon, and other materials listed in the aforementioned table, represent recommended maximum quantities that can ever be discharged to Escambia Bay. In other words, after reaching the recommended degrees of treatment included

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in the report, no further increases of pollutional materials could ever be discharged by present users of the stream and no future use could be made of the stream that would increase the discharge of quantities of materials listed in the table into Escambia Bay.

We have been advised by FWPCA personnel engaged in the study leading to the preparation of the report that only six samples were taken of the effluent from the Container Corporation's treatment system effluent on, I believe, four days. The results of these six samples, which averaged 25 parts per million, were used to calculate the quantity of BOD discharged by Container during the FWPCA study. The period of sampling by FWPCA followed a two week's shutdown by Container which probably explains the lower BOD concentration found by FWPCA as compared to that reported by Container over the period June 1-September 21, 1969.

The FWPCA personnel engaged in the study were advised of this shutdown period and probable lower concentrations of BOD but replied that the study could not be rescheduled.

The significance of the difference in BOD concentrations determined by FWPCA and Container lies in the fact that FWPCA apparently used their concentration and 80 percent BOD removal through Container's waste treatment system to determine the output of BOD by Container before treatment and, in turn, reduced this figure by 94 percent to arrive at the allowable contribution of BOD by Container to the Conecuh River. As previously stated, the production of BOD by Container, measured over a long term, is 56,800 pounds daily. I believe, using the FWPCA approach, the contribution or the production of BOD by Container would have been somewhere around 37,000 pounds.

If Container is held to the allowable limit of 2,230 pounds of BOD daily discharge recommended by FWPCA. the company must reduce the amount of BOD now produced by 96 percent. With completion of the 150 ton per day expansion presently under consideration by the company, waste treatment efficiency to the degree of 96.4 percent BOD removal would be required to comply with FWPCA's allowable load.

A requirement that Container reduce its BOD by 94 to 96 percent merits consideration. Our experience with treatment of pulp and paper mill waste is that removal of BOD consistently in excess of 85 percent cannot be attained except at sites where land and topographic features permit long-term storage in oxidation ponds with retention periods of up to six months. There are several pulp and paper mills in Alabama with secondary treatment facilities, all of which submit operational data to the Commission. We would be happy to review these data with representatives of FWPCA to demonstrate that BOD removal to the extent recommended by FWPCA cannot be attained consistently with present technology except at sites where large land areas suitable for long-term impoundment exist.

The voluminous data on water quality on the Escambia River neither indicates nor suggests that Container is contributing BOD to Escambia Bay. A review of BOD data for the Conecuh River above Container's discharge and for the Escambia River below Florida Highway 4 near Century will support this contention. Any association of Container with contribution of BOD to Escambia River must be on a hypothetical basis which does not justify the conclusions and recommendations in the FWPCA report.

In Table 2, following page 23 of the FWPCA report, Container is listed as discharging 495 pounds of Kjeldahl nitrogen, 193 pounds of ammonia nitrogen, and 3.4 pounds of nitrate nitrogen daily. These discharges of nitrogenous materials are attributed to Container without consideration of background levels in Container's water supply. According to FWPCA data collected in 1968, the concentrations of these nitrogenous materials in the Escambia

River at Century, Florida, were significantly lower than those in the Conecuh River upstream from Container. In 1969, they were also lower but to about the same degree. Phosphorus was about the same in 1968 above and below Container, but higher in 1969 when only one sample was collected upstream from Container.

It is also stated in the FWPCA report, page 45 that Container is responsible for sludge deposits originating from volatile solids in the central portion of Escambia Bay north of the L&N Railroad and is a source of organic deposits in the bridge section, in Mulatto Bayou and in Escambia Bay. Neither of these allegements concerning sludge deposits nor organic deposits are supported by facts.

The recommendation that "Color in the Escambia River at the Alabama-Florida State line as measured at Highway 4 bridge near Century, Florida, (be) reduced to background levels measured above the Container Corporation of America discharge" does not accurately reflect the standards of Alabama and Florida pertaining to color. Both States permit the addition of color to the extent that it will not unreasonably affect the aesthetic value or be injurious to aquatic life, in the case of Alabama; or it will not create a nuisance, in the case of Florida.

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We have previously acknowledged that a color problem does exist at and immediately below the State line and have stated that Container will be required to reduce the color in its waste when an economically feasible method for doing so is developed.

The reduction of color, or rather elimination of color because of the recommendation of the FWPCA has been discussed already at this conference in answer to a question posed by Dr. Myers. The reply was that there would be dilution water available to offset any color introduced by Container. It might be interesting to consider these data that were acquired by FWPCA in 1968. From approximately 16 samples, the color in the Conecuh River at Brewton was 57 units. The only stream that would provide any water of sufficient quantity to be considered to afford dilution would be Big Escambia Creek. During that same study, the Big Escambia Creek at Flomaton had 47 color units. Since the Big Escambia Creek contributes only about 19 percent of the dry weather flow to the Escambia River at Century, I do not think that it could be able to dilute much color considering the fact it was pretty close to the same color as the Conecuh River above Brewton.

Summarizing our position, we do not disagree with the finding that water quality has deteriorated in Escambia Bay. This is not surprising in view of the low quality of water existing in the Lower Escambia River over the past 10 or more years. This condition was first documented in a joint study conducted by the Commission and Florida State Board of Health in August 1958. We are not convinced that sources of waste within Alabama are contributing to this condition, and consider the conclusions and recommendations appearing in FWPCA's report relative to the degree of removal of BOD, nitrogenous materials, and phosphorus by Container Corporation to be unfounded and unrealistic.

Incidentally, on page 46 of the FWPCA report, it is stated that Container is a relatively minor contributor of carbon and phosphorus in terms of the effects on water quality in Escambia Bay. We submit that Container's pollution control program supplemented by improvements under way will adequately protect the waters of the Conecuh-Escambia River system and conform to standards of water quality with the exception of color. We have stated that Container will be required to reduce the color of its wastes at such time as research and demonstration projects presently in progress with Federal support reveal practicable solutions to this problem.

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We are quite concerned over the inference in the FWPCA report that further increases in existing or new discharges of BOD to Escambia Bay cannot be permitted. If this be the case, growth and development along the Escambia River and Bay and perhaps the lower Conecuh River may well come to a halt.

Thank you.

MR. STEIN: Thank you, Mr. Crockett.

Any comments?

MR. PATTON: Yes, sir.

MR. THOMAN: Do you want to start?

MR. STEIN: Well, it looks like you are joining the issue.

MR. THOMAN: Joe, I don't believe, first of all, that it is an inference that further increases in existing discharges of carbon to the Escambia Bay can be permitted; I think that we have flat out stated this, and we are willing to hang whatever hats we have -- I don't wear one and I haven't very much hair either to keep my head warm -- but we will stick our hat in the ring on this one.

I think that this is where I was getting at Mr. Law this morning in trying to tell him in a nice way that they very well should possibly consider a major interceptor around Escambia Bay and discharge to the Gulf of Mexico after thorough treatment, too.

First of all, we are plowing here some very, very new ground, and I made a statement to the newspapers and radio here that this was going to be one of the most significant enforcement conferences held in the last 5 years, and I am still willing to stick by that statement. But we have found, in some recent experiments, still in the research stage, that the controlling factor in algal growth and reproduction is not phosphorus and nitrogen, as it has been considered to be, but it is carbon in the form of carbon dioxide, the carbonate and bicarbonate ions, primarily the carbonate and bicarbonate ions. In fact, algae requires less than one microgram per liter for proper metabolism and we are not talking about levels down to that.

I think that at the time of the 1963 conference, Mr. Stein and myself both congratulated Container Corporation of America on its efforts in waste treatment at its Brewton, Alabama, mill. I still feel exactly the same as I did then that they are to be congratulated, and I like to be publicly on record as saying the only trouble is that now we have come to the point where we are -- "we," and I am talking about the people -- are going to have to go that second mile, and this includes the Container Corporation of America plus the other industries and discharges to this river system, i.e., we are dealing with a very delicately balanced system in an estuary and it can assimilate and it can take so much carbon, and that is all it can take.

Now, we have been basing, you and I have been basing our allowable discharges to free-flowing streams on the basis of how much carbonaceous material and how much nitrogenous BOD that a stream can assimilate. We have done it for years. You have done it maybe just a couple of years longer than I have.

The fact of the matter is that we are merely now adopting and using that same principle that we have always used to a consideration of the total carbon that can go into the thing.

We are going to have to limit the amount that comes into this Bay; otherwise the Bay isn't going to be fit for anybody to use, and it is going to stifle development.

Now, on the color part of the thing, Joe, in all candor, this part of the thing was put in our recommendations knowing full well that at this immediate point in time there is no economically feasible method of color removal, but also knowing full well that there is a

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technically feasible method of color removal that has been demonstrated at the Interstate Paper Corporation's plant in Riceboro, Georgia. We also have, as Mr. Traina mentioned, three research and demonstration grants out on this.

It may be Container is cooperating -- no, it isn't Container, it is somebody else who is cooperating with Interstate on the carbonation part of the thing. We are expecting an application from Interstate within the next few months to go on with the calcifying of the sludge. There is also the possibility that another mill in Alabama may seek a research grant to test a new project involving the addition of alum for the use of color, and I think that at this point in time the conferees should take under consideration and attempt to set some sort of a schedule that Container Corporation at Brewton should adopt or should be held to moving forward in its color removal phase of the treatment process.

I think that if industry knew that within a year or two years after one of these processes is developed it is going to have to put it in, that it is in a lot better position for planning than it would be if suddenly two years from now they were clobbered with it and suddenly you have to have this in within six months.

The last point, again, is that I want to say that from my experience -- and not only with the Alabama Water Improvement Commission but with the Container Corporation of America -- that it has done everything that I have ever asked it to do. They did receive the highest commendation. They certainly are not a Johnny-come-lately to this field, and for that they deserve the highest approbation. I think now is the time that they are going to have to go the second mile; and some of the other industries that haven't done anything in the past are going to have to go the whole hog at one time.

MR. PATTON: Of course, regarding the color removal, I think -- we have told Container not just yesterday but as long as perhaps two years ago -- I don't recall -- that they are already on notice with respect to color removal.

With respect to going that second mile, as you say, the position that I have taken here is that the disassociation of Container with the discharges of nitrogenous materials and carbonaceous materials to the Bay -- I don't think it has been factually demonstrated, and I have used your own data here, in the case of nitrogenous materials, to demonstrate that.

MR. THOMAN: Mr. Gallagher, do you want to reply to that? I believe that you told me this morning -- and correct me if I am wrong -- that using the river data that only about 65 percent of the Container's discharge is assimilated by the time it hits Escambia Bay, and that in this report you have given them credit for 80 percent on an assumed basis. Is that correct?

MR. GALLAGHER: Yes, Mr. Thoman, that is correct.

Looking at data that were collected on October 27 of this year, and representing only one to three grab samples, there is about a 70 percent reduction in BOD in the river, in a combination of Container's wastes and material coming down from upstream of Container.

To be perfectly fair about this thing, we wanted to know what Container's contribution was to the Bay, not what the upper -- the uncontrollable inputs from upstream were. We took the theoretical calculations, based on the waste load that we measured in the six samples to conclude what the rate of decomposition was, of stabilization was, of the Container waste, and this came out to 80 percent, which indicated the waste was decomposing faster than the combination of both the waste and upstream sewer -- upstream uncontrollable sources.

MR. THOMAN: Joe, again, I am maybe beating a dead horse. Container Corporation deserves the highest commendation for what it has done in the past, and I want to be firmly on record with that.

I think that we have a new ball game, that we have a new era, that we are getting into; and I think that it could well be -- and I am not suggesting -- the location of the mill may not have been in the proper place, but, again, that is something that is done, and it is there, and at the time the mill was built in, I think, the late fifties, we didn't have the knowledge then that we do now, and I think that in the future that industries are going to have to be much more careful about selection of plant sites if we are going to protect the environment.

MR. CROCKETT: That, I agree.

Now, let's go back to the nitrogenous materials. Can that be explained? In the first place, I would like to say this: I believe you know in the biological processes of waste treatment of pulp and paper mill waste, in just about all cases, you have to add ammonia and phosphorus in order to effectively treat the stuff. But this can't necessarily be explained, that contribution of nitrogen by Container to the Bay.

MR. THOMAN: Tom, would you like to answer that?

MR. GALLAGHER: Mr. Crockett is totally correct. The kraft mill wastes are usually nitrogen poor. We did not measure the influent nitrogen; we did not measure the influents of any of the waste sources. We did an effluent waste source survey to see what was reaching the river. The effluent wastes that we measured in the six samples from Container Corporation, the results are shown in Table 2. It should be noted, and was noted several times in the report, that this concentration of nitrogen coming from the Container effluent is the smallest concentration of nitrogen from any of the five sources, and the fact is three to four times less than the next higher source, amounting to 3 percent about of the total. It is the smallest source of nitrogenous wastes.

MR. STEIN: Do you want to comment on this or not?

MR. CROCKETT: The only comment is: still recommended removal of it up to 94 percent?

MR. STEIN: We are not going to meet this problem, I think, unless we do it. We are going to have to determine whether, in fact, these nitrogenous wastes have to be controlled to protect Escambia Bay. If that is the first determination, then we have to determine the significant contributors of nitrogenous wastes.

Our report -- at least the Federal report -- says that Container Corporation is one of these. Now, until we get to that notion -- and this is something you have not agreed to yet, or we don't have agreement between the Federal investigators and you -- is that the Container Corporation of America is a significant contributor of nitrogenous waste to Escambia Bay.

By the way, it seems to me, for you technical guys, that this should be an easier thing to determine unless the nitrogenous waste wasn't causing the problem. This is a straight computation. What is the problem here?

MR. GALLAGHER: There is no problem, Mr. Stein.

Container does have nitrogenous material in its waste effluents. It is quite small compared to any of the other sources of waste. However, they do discharge nitrogen.

MR. STEIN: Do they make a significant contribution to Escambia Bay?

MR. GALLAGHER: No.

MR. STEIN: They don't?

MR. GALLAGHER: I don't believe that the total amount of nitrogen that is discharged from the Container Corporation of America is a significant contribution in terms of eutrophication.

MR. STEIN: Then, what do you want to --

MR. GALLAGHER: We went across the board on any source of nitrogen effluent; we went across the board on removals.

MR. STEIN: In other words, you don't disagree.

Let me ask you this question: If Container Corporation does not remove its nitrogenous wastes and your other sources did, you wouldn't have very much of a difference, would you?

MR. GALLAGHER: I think the factor of safety is acceptable. What that means is no.

MR. STEIN: In other words, the only reason you recommend that they remove nitrogenous wastes was for equity?

MR. GALLAGHER: Yes, that they were a source of nitrogen.

MR. STEIN: We are trying to get at what you say. In other words, you guys don't really disagree. You don't disagree on the facts.

MR. GALLAGHER: No, we do not disagree on the facts; we disagree on whether or not --

MR. STEIN: You may disagree on the philosophy.

MR. GALLAGHER: All right.

MR. STEIN: That is what we wanted to get from you.

MR. CROCKETT: From what Tom has said, I think we can work that out.

MR. PATTON: Mr. Chairman, I would like to ask what the BOD will be that will be released when the mill production is increased and the new aerators are added?

MR. CROCKETT: Right today I don't think I could give you a good estimate. This 83.6 percent -- I better look at that and get it correct.

MR. PATTON: That is what you say.

MR. CROCKETT: The 83.6 is a pretty good removal, with the present methods we employ in treating our paper mill wastes. Certainly I would expect added removal or an increase in removal with the addition of an aerated basin such as is under construction now.

I hesitate to say just how much more that would be. Very frankly I would like to see some accurate determinations of flows out of the waste treatment system so that we could be sure that we are getting this percentage removal now. It would be higher than that, but how much higher I would not care to say.

MR. PATTON: One other question I would like to ask: Has Container considered water reuse in plant reductions to increase the efficiency of reductions in the contaminants released?

MR. CROCKETT: Mr. Whiteside, who will follow me, the general manager of the Brewton mill of Container, will probably discuss that point.

In their expansion program, they are installing additional equipment which will reduce, as I understand it, the contribution of waste. He will be better qualified to answer that than I, but they have been, over the years, the low contributors of BOD on the basis of per ton of product -- among the lowest in the industry. This has been consistent throughout the years, so you can only draw from that that they have done a pretty good job of in-house work.

But, even so, there will be, through this new equipment Mr. Whiteside can describe to you, a further reduction in BOD generated as compared to that now. It would reduce the increase impositioned by the expansion.

MR. STEIN: Let's see if I can get something. I think the BOD -- are you through, or have you got some more?

MR. PATTON: I had one further comment I would like to get in the record to reinforce what Mr. Thoman said: that I think the time has come when we cannot permit the continued adding of contaminants to the Bay or any of our other bays. Admittedly it is going to be a very difficult and expensive problem to solve, but if we are going to solve the problems, we have got to draw the line somewhere.

MR. STEIN: Well, I think that is what the report says.

Let's see if I can get you people together. Is Gallagher still around, or did he leave?

Let's see if you can come up here again and deal with this factually.

What did you say, on the basis of page 6, that Container Corporation would have to do now? I am not talking on the basis of equity, but what would Container have to do to ensure that they were not contributing to the pollution of Escambia Bay and River?

MR. GALLAGHER: Container Corporation should remove an overall 94 percent of their carbonaceous wastes and 90 percent of their phosphorus wastes.

MR. STEIN: In other words, what you have recommended here.

MR. GALLAGHER: Exactly.

MR. STEIN: How would that improve the conditions here if they did that?

MR. TRAINA: Mr. Chairman, let me comment on this whole thing. I will try to put it into perspective here. As we indicated earlier, and I made the point in my presentation this morning, the philosophy as well as the technical backup to this entire analysis is based on maintaining concentrations of carbon, nitrogen, and phosphorus in Escambia Bay to those which have been demonstrated to not cause problems in other areas.

Now, with that kind of philosophy, we established the fact of what was going into the Bay and we applied a reduction across-the-board, as Mr. Gallagher said, to all waste sources that were contributing to those parameters.

Now, with that kind of approach -- and this was the only one, frankly, that as technical people was open to us -- we have come up with these levels of reduction.

To answer your question: If Container was to not make these reductions, then somebody else is going to have to make those reductions.

MR. STEIN: Well, if that is --

MR. TRAINA: This, I think, is up to the conferees.

MR. STEIN: **Now,** you have got a key question here because that was not what was answered before. As I understand Mr. Crockett's statement, it was that the contribution of Container was not at all felt on the Escambia River or the Escambia Bay in Florida.

MR. TRAINA: The carbonaceous loads --

MR. STEIN: Come on up. If I am wrong in stating this --

MR. CROCKETT: The load of BOD is certainly reflected in the upper reaches of the Escambia River, and I was contending that it had not been factually demonstrated that Container was contributing BOD to Escambia Bay.

The other contention was that it had not been demonstrated that Container was contributing any nitrogenous materials to Escambia Bay, which I understood Paul and Tom to just remove nitrogenous materials from --

MR. STEIN: No.

In other words, you say, Joe, that the stuff that they are trying to remove is getting down into Florida? Are you saying it goes and has an effect in Florida or not?

MR. CROCKETT: Carbonaceous BOD, yes. The BOD at Highway 4 near Century, Florida, is increased by

Container's contribution. I was simply saying that that contribution had been dissipated by the time -- or could not be determined by facts; it has been determined by us theoretically -- that it was reaching the bay. We are talking in terms of the bay.

MR. STEIN: Well, I understand that.

MR. CROCKETT: I did say, and I also said, that the nitrogenous materials were lower below Container than above. In other words, they were not affecting this part of the water in Florida, based on FWPCA data. The phosphorus is increased.

MR. PATTON: A couple of questions, Mr. Chairman.

As I recall the data in the report was based on 5-day BOD, and I believe the time of travel is such that some of the material could very well and does reach the bay, and I doubt seriously that BOD from a paper mill is going to be taken care of in five days unless -- and if they took five days, I think oftentimes you talk in terms of 20-day BOD to reach the point of what it is more actually.

MR. STEIN: I think we are going to have to go over time. Let me make this point to the people from Alabama. I am not talking theory now, I am just trying to get facts that we agree on.

We were asked to come in by Florida. If all the people who are dealing with the technical facts agree that the effect of BOD or carbonaceous, certainly phosphorous, and possibly nitrogenous material has an effect from the Container Corporation at Brewton in Florida waters and isn't dissipated before it gets to Florida, I think as far as the Federal Government is concerned, this is a prima facie indication we have jurisdiction. I think this is what we will come out with from what you people say. I am just speaking here and then we will open it up to this forum.

Now, the effect of that, or the reduction of that are things we are going to have to talk about, but it seems that everyone has agreed that this gets done below the State line.

MR. CROCKETT: I have not denied that the BOD was not increased at Florida Highway 4. I don't know of any water quality standards that impose a limit on BOD. At the same time, all I have heard and read in the report and heard is that there was no other conditions of water quality that were affected really at Highway 4 near Century except color. Biological conditions are satisfactory, and if the BOD is increased to --

MR. TRAINA: This is true, and the report did not indicate -- and I hope I made that point clear -- that there is an interstate problem at the State line and the dissolved oxygen readings and the biological information, except for the few years that I have noted, because of low flows -- there is no problem at the State line.

However, the point is that in terms of the bay, the contribution of all carbonaceous, nitrogenous and phosphorous materials contributes to the problem of Escambia Bay, including Container, and that is the point.

MR. STEIN: The point you are making, as I understand your point, is that Container's wastes indeed contribute to the nitrogenous and carbonaceous problems in the bay. I think we all agree that if there are any phosphates, they persist, and the only question we have is with the carbonaceous and nitrogenous materials.

Your contention is they persist into the bay, that you can factually trace these down to the Highway 4 bridge in Florida, and because of the mixture of the stuff from Florida, from there on your computations of what is happening in their contribution in the bay are based on theoretical judgments, is that correct?

MR. TRAINA: We made a theoretical judgment on the carbonaceous.

MR. CROCKETT: I don't want to keep arguing the point, Murray, but you included nitrogen, too.

MR. STEIN: Yes.

MR. CROCKETT: And these nitrogen concentrations, as measured by FWPCA, are lower at Century than they are above Container, so Container can't add.

MR. STEIN: Do you want to address yourselves to that?

MR. TRAINA: This is true. Once you put nitrogenous material in the system it stays in the system.

MR. STEIN: Then how --

MR. CROCKETT: This is the anomaly of sampling on a periodic basis.

MR. TRAINA: Now, again, I think Mr. Gallagher addressed himself to the relative contribution of nitrogen.

MR. STEIN: What you are possibly saying is this: that nitrogenous material, and the phosphorus once put in the system stays in the biologic mass. The only thing that may be dissipated before it gets downstream is the carbonaceous material.

MR. TRAINA: That is correct.

MR. STEIN: In other words, what they are saying, Joe, if I understand their theory -- what they do is they calculate the amount of nitrogen or phosphorus coming from a particular source and automatically add that to the system and say that will be in the system's life, and if you are going to control it you have to control those sources.

MR. CROCKETT: If Container were taking their water supply from the ground, from a deep source, with the absence of nitrogen, I would agree. They are taking it from the river, and they are taking the river water for some -- this is 16 samples in 1968. It had a higher nitrogen concentration above their intake than it had below. They are actually taking it into their system and putting it out and being credited with nitrogen that was already in the river.

MR. STEIN: You **mean** to say that they are not adding nitrogen with the Container Corporation's treatment operation?

MR. CROCKETT: We have some paper mill experts, but the paper mill just doesn't add any nitrogen to the system.

MR. STEIN: Not in the paper mill operation?

MR. CROCKETT: Not in the production.

MR. STEIN: That is right, but you know they have to add these nutrients for the treatment facilities.

MR. CROCKETT: They are not adding any nutrients at this time. Now, if they did add nutrients, they would be consumed in the process.

MR. STEIN: Well, how do we -- what is your response?

MR. TRAINA: I think, then, the only thing we need to do is to evaluate the upstream data and determine what the contribution of Container is. Apparently this is a point of contention.

MR. STEIN: I think it is a factual point. Obviously if Container is not putting in any nitrogen they don't have to take any out. No one says they have to take out what they are not putting in. Are we agreed on that?

MR. TRAINA: Obviously.

MR. STEIN: We are agreed. This is fine. At least we are narrowing the issue.

MR. CROCKETT: I had it a few minutes ago.

MR. STEIN: Are there any other questions? Anything else?

Before we recess for the night, I would like, if possible, if you could find the time for the technical staffs to try to get together and see if we can come up with an agreed-upon technical statement, because I think this is important if we are going to move ahead.

I see absolutely no reason for the technical staff to have any disagreement on the facts of the matter here to present to the conferees. I think this would simplify the issue considerably if we could work this out.

MR. CROCKETT: If I might say so, I really think this particular point we have been discussing for the last few minutes, Murray, would have been worked out had we had -- both we and Tom Gallagher and Paul Traina -- had a little longer time to sit down and evaluate the full report together. Usually this happens, and when they come out with a report they send it to us. We go over it and make notations of something we disagree with and then get together. We did not have an opportunity, through no fault of theirs nor ours either.

MR. THOMAN: I apologized for that this morning. You know the reason.

MR. CROCKETT: I say through no fault of ours nor theirs.

MR. STEIN: No, this isn't a question of fault or anything.

Now, let me tell you this -- and this is, I think, a fair statement here: I think, under a Federal State system, that this is the nature of the beast, i.e.,

-- and I read you some dates this morning -- when we get requests for a conference -- and this is not just here, because at the end of this week we are going to take up the Perdido Bay conference, and we were requested to come in there by Governor Brewer of Alabama.

Now, you will recall that on the first of the month, we got a letter from the Governor of Florida. We answered it on the 11th. Now, in the Federal-State system I think the Governor was entitled to a prompt response. This is a Federal responsibility. We answered on the 11th and called a conference pretty rapidly. Now, recognizing this -- and this is the Federal people, not the State people, by any means -- we know in conferences of this type we put a lot of pressure on the scientific people in getting their data together and the report out. Sometimes at the conference or even after, we have then to catch up.

I know I have worked with you people, with you and Arthur in Alabama, for many years, on very similar problems. Where there are these loose ends, to my knowledge, we have never, not once, failed to come up with a solution or work it out in this kind of area, or, I might say, for that matter, any.

But I would hope and I don't think that you people are very far apart. As a matter of fact, I am not sure you are apart at all. Let's try by tomorrow to come up with a formulation that you both can agree to.

I don't believe this is an impossible task. You might even enjoy yourselves doing it.

Are there any other comments?

DR. MYERS: Mr. Beck will be representing the Alabama Water Improvement Commission for the purpose of this hearing tomorrow since I will be unable to be here.

MR. STEIN: Thank you, Dr. Myers.

We will stand recessed until 9:30 tomorrow.

(The conference recessed at 5:25 p.m.)

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H. G. White

WEDNESDAY MORNING SESSION

January 21, 1970

9:30 a.m.

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MR. STEIN: The conference is reconvened.

We will continue with Alabama's presentation, Mr. Beck.

MR. BECK: Yesterday Mr. J. L. Crockett of our staff gave the views and the report for the Alabama Water Commission.

The first speaker this morning will be Mr. H. G. White, Chief Engineer of the Alabama Oil and Gas Board at University, Alabama. He will tell us something about the oil fields and the way the waste is handled from these fields.

Mr. White.

STATEMENT OF H. G. WHITE, CHIEF ENGINEER, ALABAMA OIL AND GAS BOARD, UNIVERSITY, ALABAMA

MR. WHITE: Mr. Chairman, conferees, ladies and gentlemen. I am H. G. White, Chief Engineer of the State Oil and Gas Board of Alabama.

H. G. White

The Alabama Oil and Gas Board was created by Act No. 1 of the 1945 General Acts of the Alabama Legislature. The Board consists of three members appointed by the Governor of Alabama for staggered terms of six years each.

The Alabama statute creating the Oil and Gas Board reads, in part, as follows:

"The Board shall have the authority to make ... such rules, regulations, and orders as may be necessary ... to require the drilling, casing, and plugging of wells to be done in such a manner as to prevent the escape of oil or gas out of one stratum into another; to prevent the intrusion of water into an oil or gas stratum from a separate stratum; and to prevent the pollution of fresh water supplies by oil, gas, or salt water."

Order No. 1 of the Alabama Oil and Gas Board prescribes general rules and regulations of statewide application. Rule B-6(A) of this order prohibits the contamination of fresh water by objectionable water, oil, or gas. Since our primary concern here today is the interstate pollution of the Conecuh-Escambia River system, I will, for the most part, confine my remarks to the oil or gas fields located within this river system. I would like to state though that the waste disposal systems that will be discussed are employed in all oil or gas fields in the State of Alabama with the exception of two small stripper fields.

The Pollard oil field is located in south-central Escambia County, Alabama, approximately 3-1/2 miles north of the Alabama-Florida line. The discovery well for this field was completed in early 1952 through perforations at approximately 5,950 feet. At peak production, the Pollard field produced more than 950,000 barrels of oil per year from 36 wells. Current production from 30 wells in the field is 615 barrels of oil and 13,000 barrels of salt water per day.

Reservoir energy for the Pollard field is supplied by a very active water drive. One of the characteristics of this type of reservoir drive is the decrease in oil production and increase in water production with time. The water-oil ratio in the Pollard field has now increased to the point that of the total fluid produced only 4.5 percent is oil.

The Flomaton gas-condensate field, located in the same general area as the Pollard oil field, was discovered in the latter part of 1968. This field will produce gas-condensate from a depth of approximately 15,300 feet. Production from this field will require the construction of an elaborate gas processing plant prior to the wells being put on stream. We do not anticipate any pollution problems from this field.

I would now like to point out some of the pollution abatement measures taken by the Alabama Oil and Gas Board in the Pollard field area. In 1962, the State Oil and Gas Board entered into a cooperative program with the Water Resources Division of the U. S. Geological Survey to study water problems associated with oil production in Alabama. At that time, some surface pits were being used in the Pollard area for the reception of brine. The study proved beyond any doubt that some pollution of subsurface fresh water-bearing aquifers was occurring. On the basis of this study, the State Oil and Gas Board ordered operators in the Pollard field to cease using surface pits for the reception of brine and to dispose of all produced brines into proven salt water-bearing subsurface aquifers.

Mr. Stein, I have some slides to show, and I would like to ask you and Mr. Reed, if you would, to slide around.

MR. STEIN: While we are setting up for this, I would like to say that the camellias up here are from the garden of Filo Turner of Gulf Breeze and Pensacola, and the arrangement has been made by Mrs. John J. Guice, and we are really grateful for the wonderful and beautiful support shown by the people here.

MR. WHITE: Slide No. 1.

... Slide ...

MR. WHITE: This is a schematic diagram of the salt water disposal system used throughout most of the State of Alabama. In this system, salt water separated from oil at a heater-treater is brought to a surface treatment facility. A minute amount of oil is usually carried over from the heater-treater into the treatment system and a tank arrangement is provided to allow the oil to separate naturally from the water at the disposal treatment facility. This oil and some sediment that is usually produced must be removed before the salt water is injected into the disposal well. The disposal well is drilled through all fresh water-bearing formations and into a known salt water-bearing aquifer. The well is cased to total depth and cement is circulated to the surface. In addition, tubing is run into the well and a packer is ordinarily set above the disposal aquifer. Pressure gauges are installed at the surface to reveal any pressure change in the annular space between the tubing and the casing. Pressure readings enable operators to detect and correct leaks or failures in the down-hole tubing-packer assembly. The next slide shows the surface installations at a disposal site.

... Slide ...

As part of the U. S. Geological Survey cooperative program with the Alabama Oil and Gas Board, monitoring stations have been established at optimum points on streams in oil field areas.

... Slide ...

This slide shows the general location of the Pollard and Flomaton fields and shows the location of a monitoring station on Little Escambia Creek downstream from these fields and approximately 1-1/4 miles upstream from U. S. Highway 31. Samples are collected from this monitoring station at least monthly and analyzed in the U. S. Geological Survey's laboratories in Tuscaloosa.

... Slide ...

This slide shows the results of analyses of water samples collected from this monitoring station over the past several years. As you can see, the chloride content of the water at the monitoring station on Little Escambia Creek is, and has been, minimal. The close relationship between stream flow rate and chloride content is also indicated.

H. G. White

In addition to the monitoring program being carried out by the U. S. Geological Survey, members of the staff of the State Oil and Gas Board inspect every drilling or producing installation in the State at least once monthly and file a report with the main office of the State Oil and Gas Board in Tuscaloosa, Alabama.

The State Oil and Gas Board works very closely with the Water Improvement Commission in designing and implementing programs for the abatement of pollution of fresh water by deleterious oil field substances. We believe that continued full cooperation between sister State agencies, agencies of other States, and agencies of the Federal Government is absolutely essential to preserve one of our most vital natural resources, fresh water.

In conclusion, we of the State Oil and Gas Board of Alabama firmly believe that the pollution abatement programs that have been implemented in oil field areas by the State Oil and Gas Board are adequate to protect the fresh water in these areas.

Thank you.

MR. STEIN: Thank you.

Are there any comments or questions?

FROM THE FLOOR: What happens to the steel pipes --

MR. STEIN: Let me repeat the rules. When I ask for comments or questions, I am talking to the panel up here. We don't accept those from the audience. If you want to make a statement, you have to put your name in; otherwise we will be here for a rather long time.

Are you using this reinjection for flooding or are you putting in an aquifer that is not oil bearing?

MR. WHITE: In the central oil field in Mobile County we are flooding the oil-bearing sands. In the Pollard field it is simply a disposal system; they are not being reinjected.

MR. STEIN: Well, given the figures that you are using of the brine and oil, do you figure that field is going to phase out? How long is that going to continue? It looks pretty high now.

MR. WHITE: Mr. Stein, one of the operations in the field now only produces two percent oil and I can't see --

MR. STEIN: Well, I looked at your figures and, you know, our business is not oil well economics, but it would seem to me, on the basis of what your Commission has said, that this Pollard field looks like a field that is phasing out.

MR. WHITE: It definitely is phasing out, and over the next several years -- I won't say several years -- it will be phased out very shortly. There are certain other elements that enter into this thing such as production from a field holding deep rights to minerals, say, 15,000 or 30,000 feet. Companies can afford to operate wells at a loss if by so operating these wells it retains the deep mineral rights in the area.

MR. STEIN: Okay.

Now, one thing: The U.S.G.S. station just records conditions of surface water.

MR. WHITE: This is correct. However, we do have subsurface monitoring stations in the Pollard field.

MR. STEIN: I wonder if you would expand on that. I think it is fairly clear, and I don't know that anyone has said that what you are doing by reinjection in the Pollard field or anywhere else in the State is not protecting surface water. The question is what they are doing to the underground aquifers and how do you determine that you have reasonable results which are not contaminating fresh water sources?

MR. WHITE: Well, the thing that kicked the study off by the U.S.G.S. was a comment by a farmer that his fresh water supplies were going to chlorine or chlorides -- high chlorides. Since we have stopped the use of these pits, we have kept a continuous monitoring program going in the area. We see the water supplies freshening up to such an extent that one of the wells which originally was totally destroyed could now be used for a domestic water supply. This slug of salt water is in there. It moves back and forth, back and forth, and it is going to take some time for the influx of fresh water to dilute and dissipate this slug of salt water that is underground.

MR. STEIN: That is, at present, underground, but that was prior to the time you had the injection system, right?

MR. WHITE: This is true.

MR. STEIN: I don't know that you had to wait for a farmer to tell you. I could have told you if you used those pits what was going to happen.

But what I am getting at, sir, is given this present system of injection into the underground strata -- and I am not familiar with the strata in this part of the country -- such as certainly that underlying the Pollard field, would you indicate what kind of strata that is going in; how much of a slug of salt water you have down there; how far that is expanding; what your judgment is and how you test, if any, to indicate that you have that contained?

MR. WHITE: First of all, let me say that prior to any of these wells being converted purposely for salt water disposal, we require the operators to obtain a sample to submit to the U. S. Geological Survey labs for analysis. In addition to this, we analyze electrical logs and other logs that are run on the wells so that we are absolutely certain that the aquifer receiving the salt water is a salt-water-bearing aquifer and not a fresh-water-bearing aquifer.

I don't have any cumulative figures as to how much salt water has been injected in the Pollard field, but we do know that the water has traveled for quite some distance in the salt-water-bearing aquifer itself, because in drilling an additional well in the field the operator encountered such a high rate of flow in the salt-water-bearing aquifer that had been charged up by injection that he had about a $30,000 mud bill trying to contain the salt water flow. So it has --

MR. STEIN: I don't want to get into too detailed a discussion, particularly on the oil well brine. Unless you are familiar with the oil business and have a lot of experience in this, I guess most of you people are very confused. But let me ask one question here, in that I don't doubt that with your electrical logs, your checking, that you don't have leaks, and you are going down through a salt-bearing aquifer in the bottom. Is that salt-bearing aquifer sealed off by impervious layers from fresh water, or where does that go?

The questions we have got to ask -- and let me give you this -- is that salt going into what everyone will agree is a salt-bearing aquifer? What are the chances of its getting out of that into a fresh water undergound souce? This is the problem.

MR. WHITE: The salt-water-bearing aquifer that is receiving the produced brine is caught by an impervious material. The point is valid that any fault in the area would raise serious questions. We hopefully have enough monitoring stations with other wells that we can reverse the flow from one to the other, that we do believe that all of the salt water is being contained in the aquifer that it is intended to be contained in.

MR. THOMAN: Mr. White, does the U.S.G.S. have all of those log data?

MR. WHITE: The State Oil and Gas Board has all this data.

MR. THOMAN: I see. And you haven't, as part of any cooperative program given it to U.S.G.S.?

MR. WHITE: We are fortunately housed in the same building. They do have access and information. They do work on it daily as part of our cooperative program. One man is assigned almost entirely to work with me and my staff in the oil field areas.

MR. STEIN: Are there any further questions or comments?

Thank you very much.

MR. WHITE: Thank you.

MR. STEIN: Mr. Beck.

MR. BECK: The next speaker is Mr. George H. Whiteside, the General Manager of Container Corporation of Brewton, Alabama, who will speak to the operation of his mill.

Mr. Whiteside.

STATEMENT OF GEORGE H. WHITESIDE, GENERAL MANAGER, CONTAINER CORPORATION OF AMERICA, BREWTON, ALABAMA

MR. WHITESIDE: We have a display. I will wait until they bring it up so we won't disrupt everything.

MR. BECK: Do you have a prepared statement for the panel members and the press, Mr. Whiteside?

MR. WHITESIDE: My prepared statement has been amended so much that it wouldn't be of very much use to you.

Mr. Stein, ladies and gentlemen, I am George Whiteside, General Manager of the Brewton Mill of Container Corporation of America. I would like to give you some background information on Container Corporation of America's plant at Brewton, Alabama, and outline to you steps taken over the years for effluent treatment. The Brewton mill has two paper machines; one producing bleached kraft foodboard, and one producing linerboard.

A total of $60 million is invested here. With an investment this large you can see that we came to stay and must, therefore, assume all the obligations of a good neighbor to live in harmony with our total environment.

The annual payroll is approximately $5.5 million with raw material purchases of $12 million a year. The mill employs 550 people and more than 800 people are employed by other firms who furnish us raw materials.

Before the site was selected, the Alabama Water Improvement Commission was contacted and preliminary plans were discussed to the extent and kind of effluent disposal equipment that was the best available commercially.

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In addition, a biological survey of the Conecuh-Escambia River system was conducted by the Institute of Paper Chemistry before the mill was operated to serve as a benchmark for the condition of the river after the mill startup. This survey has continued each year. Records from these surveys show that the lower end of the Escambia River had sludge deposits on the bottom prior to the startup of the Brewton mill.

The State of Alabama also ran tests for the common water analyses such as dissolved oxygen, biological oxygen demand, alkalinity, hardness, and so forth.

Container Corporation monitors and routinely run tests of water quality daily and weekly, with weekly summaries being sent to the Alabama Water Improvement Commission. At various times, at their request, information has been made available to the FWPCA.

As you know, we operate under a permit from the Alabama Water Improvement Commission and we have continuously operated under its regulations.

I have brought an aerial photograph so that you can follow the evolution of the current effluent system. And, John, would you point out these things when I get to talking?

In the beginning, at low production levels, two 5-million gallon settling basins were installed to prevent settleable solids from reaching the stream. In addition, a swamp and lake system with a lake area of approximately 70 acres were included for the retention and oxidation of effluent before it entered the river.

When planning was instituted for a second machine, our consultants were called in and in cooperation with Alabama Water Improvement Commission additions to the treatment system were agreed upon. These included a primary clarifier for continuous solids removal and a secondary oxidation system, and another permit was issued in mid-1965 on the completion of this installation.

I would like to outline for you the steps that have been taken since that time over and above what was necessary at that time.

In 1968, a series of low flow days indicated that permit conditions were critical and something further was required. We immediately constructed dams and incorporated two additional lakes of approximately 20-acre area. Again we called in Hazen and Sawyer, one of the foremost national consultants on water pollution control for their recommendations. These plans were transmitted to the Alabama Water Improvement Commission for their approval. Approval was given by Container Corporation's board of directors early in 1969 for $650,000 for the installation of mechanical aerators and a new aeration pond to further oxidize the effluent. Construction work is in progress. It is not known at this time when the aerators will be in service because of the General Electric strike.

An experimental procedure of adding liquid oxygen by a side stream method was installed in 1969. The effective results were so immediately recognizable that it was continued as a regular part of our effluent system.

Again, to reduce BOD level, two brush-type aerators were installed in the oxidation ponds. The ponds were increased in volume from 132 million to 176 million gallons in the spring of 1969. We are generating 56,800 pounds per day of BOD and discharge 9,300 pounds per day. This level of discharge has been defined as a result of using laboratory figures accumulated over an extended period of time. With all systems working, BOD reduction is 83.6 percent.

Tests made in 1956 indicated from 0.8 to 1.0 parts per million BOD 3 miles upstream from Monsanto. Tests run in 1957 show similar BOD and tests run in 1969 indicate the level to again have similar BOD in this area.

All tests indicate that, if the river water

G. H. Whiteside

coming to our plant is used as a basis, the water in the Pensacola area is not altered in BOD, nitrogen, and phosphorus content by our present effluent.

Because the principal source of our water is Murder Creek -- let me explain. In the upper portion of that photograph, the Conecuh River and Murder Creek come together just above where our influent is. Our influent station is shown where John has his pencil. This Murder Creek water hugs the bank and therefore is primarily picking up Murder Creek water in the influent.

Because the principal source of our water is Murder Creek into which is discharged the municipal sewage of the cities of Brewton and East Brewton, tests on mill effluent for nitrogen and phosphorus will show different results than the Conecuh River upstream from the mill alone will show.

Again, if the biological life upstream from the mill is used as a benchmark, the biological life in the stream approaching Pensacola is the same. This can be seen in the FWPCA report.

As our treatment has intensified, color of the effluent has changed from the natural yellowish color to a gray color. When this was noted, it was reported to the Alabama Water Improvement Commission, and they reported it to the Florida Air and Water Pollution Control Board and FWPCA. There are several Federal- and industry-sponsored projects under way for the effective removal of color; however, at this time, none demonstrate a technically feasible method of color reduction. We understand that we will be expected to employ the use of such color removal system whenever a reasonable method is devised.

We are currently studying all methods of color removal and are working with environmental consultants and research institutions to see how we can further improve the ecology of the river system.

The Federal report was not received in time to completely study it. We received it on January 16, 1970, but examination of the data and conclusions indicate that the sampling of effluent on September 17, 18, 19, and 20 was not representative of normal conditions in that it is based on a discharge to the river which was less than that experienced under normal operating conditions. (This fact was pointed out to Messrs. Wagner and Cafaro at the time and confirmed by letter, a copy of which is attached at page 475.)

This inaccuracy was introduced because of the mill shutdown period of September 1 through 8, and the natural drainage water through our effluent system would flush and dilute the system effective for several weeks. The assumptions made from this data of the untreated effluent should not be used. The data indicated that corrections have not been made on nitrogen and phosphorus, as our raw water source is primarily Murder Creek, which contains the sewage of the cities of Brewton and East Brewton. Recommendations as discussed would place us in a range of very, very high BOD removal which to our knowledge is not feasible without tremendous retention of one-half year or more. After reaching 90 percent removal, the increment of improvement requires a vastly great amount of retention.

There is no information in this report which indicates the BOD level entering the Pensacola area is different from that of the stream above the mill. Data from the FWPCA study of June 1968 shows that a similar situation occurs with respect to nitrogen and phosphorus.

We wish to take this opportunity to inform you that we remain most willing to participate with you in any evaluation you may wish to conduct in this matter which will be based on our normal operating conditions. We request that the record remain open for 30 days pending the results of this reevaluation.

We have this day engaged a research institution to do TOC (total organic carbon) testing. We are not familiar with the results this particular test will have when applied to paper mill effluent. We would like to use the time hereby requested to subject our discharge to this analysis. No bioassay or chemical data collected over the past 13 years indicates that Container has adversely affected the Escambia Bay. We wish to learn if the TOC measurement confirms this and if it is a relevant method for determining any adverse effect our effluent may have.

We question the correlation between the base line estuary selected which you assert will produce unpolluted water in the Escambia Bay. Particularly we question that portion of this figure you prorate to those you seek to control in an effort to correct pollution from all sources, including sources you will not or cannot control. While we do not wish to study this situation to an impasse, we do wish to point out that this concept is novel and should be subject to reasonable investigation, before it becomes the subject of a recommendation which controls the existence and future of industry in this area. Perhaps there is a higher tolerable industrial load which will provide mutually acceptable results. We respect fully request a reasonable time to investigate the proposed control and any viable alternative which may exist.

We may have to walk the second mile but not in the dark

September 19, 1969

MR. J. L. CROCKETT, JR., DIRECTOR
State of Alabama Water Improvement Commission
State Office Building
Montgomery, Alabama

Mr. J. L. Crockett:

Mr. Paul Wagner and Mr. Dennis Cafaro of the FWPCA visited us on September 17, 1969 and discussed current survey of Escambia and Perdido Bays.

The FWPCA will sample our effulent at the Brewton Lake outfall over the next week. We agreed to cooperate with them in any manner that they requested.

John Willford, of your office, was also here for the meeting.

We discussed the effect of our shutdown period (Sept. 1-8) and the reduced effulent flow during the next several weeks. It was estimated that it will be the first part of October before normal flow will be achieved. They were aware of the shutdown from our previous discussions but were not able to arrange a different schedule.

After full discussion they decided to go ahead with the sampling and the FWPCA will request from your office our data for previous months for comparison.

Enclosed is a copy of the survey outline for the study of Escambia and Perdido Bays from the FWPCA.

We will keep you advised on the survey.

Sincerely,
CONTAINER CORPORATION OF AMERICA
BREWTON MILL

John C. Fay, Jr.
Technical Superintendent

cc: Mr. Paul Wagner - FWPCA-Athen, Ga.
G. H. Whiteside - Brewton
J. P. Weidner - Brewton
W. Brantley - Brewton

JCFjr/bw
Enclosure

MR. STEIN: Thank you.

Are there any comments or questions?

MR. REED: I have no comment, Mr. Stein.

I wonder whether the fish or the biota in the river would know whether it was a normal day, or a moderate day, or a shutdown day, or an excessive day? I don't think they would, Mr. Whiteside. And furthermore I think that we were called here not only for the bay but for the river, and I think we have got a mighty sick river on our hands, too.

MR. WHITESIDE: Mr. Reed, it is essential that your information be based on the facts.

MR. REED: Yes, Mr. Whiteside, but the biota might have a hard time determining what facts they had.

MR. WHITESIDE: The facts are available if you wish to use them, but if you wish to use just a spot sample which is not indicative of average conditions, you will not be basing your results on a fair determination.

MR. REED: But, Mr. Whiteside, the fish doesn't know whether it is average or not.

MR. WHITESIDE: You know a lot more about how fishes feel than I do.

MR. STEIN: Well, let me say, Mr. Whiteside, let's try to have 15 days -- we will get to that in a minute -- just like we ruled on the other industries. We are going to keep the record open for 15 days. Try to get the material in.*

MR. WHITESIDE: We will certainly do our best.

MR. THOMAN: Mr. Whiteside, I would like to clarify something here. Did I understand you to say that the data that were in our report showed a lesser load coming out of your mill than normally exists?

MR. WHITESIDE: That is correct. That is the reason I wanted to be sure that you --

MR. THOMAN: We understand that fully, and I think this has been changed, but in that case we are giving you a little more credit and that isn't my understanding.

MR. WHITESIDE: My understanding was that you worked backwards from 80 percent to what you figured our raw load was and that this, then --

MR. THOMAN: Actually, your load is greater than we said it was.

MR. WHITESIDE: That is correct.

MR. THOMAN: I was correct on this one.

Mr. Whiteside, one thing that has happened is that the total organic carbon test is a completely valid test and one that is being used more and more in assessing the impact of pollution on situations, and I want to go again to what I said yesterday, and that is that the way that we are doing it now, or we are trying to do it now, is on the total load going into the system regardless of where it comes from. The old days of talking in terms of biochemical oxygen demand and these types of things are long gone. We have got to talk in terms of how much carbon there is and how much carbon the water body can take without becoming polluted, and this is a new concept, and it is one that is being developed.

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* See Pp. 591-600

Our utilization of the Wacasassa Estuary as a relatively unpolluted one -- as I mentioned yesterday -- is based on an extremely thorough study that was conducted by the University of Florida, and I think that it is probably as valid as anything that is going to be possible to find because we cannot get Escambia Bay back to where it was.

MR. WHITESIDE: Could we get a copy of that?

MR. THOMAN: How many did they furnish us?

MR. TRAINA: Yes, we can get him a copy.

MR. THOMAN: It was done under a demonstration grant quite a number of years ago. Mr. Traina will see that you get a copy.

MR. WHITESIDE: Thank you very much.

MR. STEIN: Mr. Whiteside, you know, with the history of your company and what you have done, I think that we can work something out on specifics. The problem in this field is that while you can have philosophic arguments, the genius of the American system in a conference of this kind is that while we don't agree philosophically maybe we can agree on a specific program. I hope we can work that out but, in fairness, you have stated some philosophic points and Mr. Reed has replied. I would like to associate myself with Mr. Reed on this, because I think we get this again and again.

Whenever we come out and make an invstigation, I might say we have never made one anywhere where we got there and industry, or a city, said we got there on a "typical" day. Never do we get there on a typical day.

Now, the analogy that I like to use is: We are here for a "critical" day. At least in the part of the country where I come from around Washington, let's take a day like today, with snow on the ground, traffic snarled, the weather around zero, and about 4:00 o'clock in the afternoon everyone has got his lights on in the office and the ladies are all putting their lights on at home to do their cooking.

G. H. Whiteside

Their heating systems need electricity. If the electricity would fail, we would get a tremendous amount of complaints. You know what happened in that blackout in the northeast. Or, let's say the telephone system failed, you would get these same complaints.

Now, the notion that we can only run for a "typical" day or make a judgment on that is not the philosophy that we hold, because if you get a breakdown, this is a crucial point in a particular area. I agree certainly with Mr. Reed, if you have these peak loads -- we don't know it, because we don't have the built-in complaints -- the fish know it, and if you wipe out the biota you are really set way back.

So the point is, at least from a regulatory agency point of view, it is a valid complaint if they go out and find conditions that are atypical. Because we are protecting those streams 24 hours a day, 365 days a year, the same way as this electrical utility is giving us service, by the way, we are all paying for it, because they have to have standby equipment to put in use at peak times. There is one other point you and several people alluded to that I would like to point out and that is other sources.

Now, everyone knows there are other sources.

But it seems to me that given a situation like this with Pensacola, five industries such as American Cyanamid, Container Corporation, Escambia Chemical, and Monsanto, I must say it sounds a little hollow. But it also seems to me that discharges like that are pointing to these diffused, undefined sources. The very fact of your program shows that you have a definite source that for years you have been working on reducing the wastes.

The reason I am saying this is I don't think we may come out very different. What we are, in fact, talking about may be a few percentages of removal of BOD or something of that kind. I fully recognize that when you go up to 90, the curve begins to increase for the amount in terms of the money you have to spend for the results you get. I am sure we can come to an agreement on that. I think we tend to bog down when we get into these philosophic discussions.

I certainly appreciate your right to hold those judgments, but you know, really, we have a different philosophy on this.

MR. WHITESIDE: I guess I didn't understand Mr. Reed's comment in the sense in which you have explained it, but what I should point out to you is:

that in a system such as ours, that certain upsets are contained in the system because of the size of the system, and these things certainly we do. We don't claim to be perfect, and we have upsets that do occur. But, then, if you shut a plant down, we have running through our effluent system Franklin Mill Creek. This flushes it out with fresh clear water, and I merely felt that you needed to have the information of what the average load was over the year, and this is why I brought this fact out, not to be controversial about it.

MR. STEIN: Okay. By the way, if there is an adjustment, I think this can be computed by the people here, and I don't think this is a problem.

Let me see if I understand it. Since your mill was shut down, you are running relatively purer water through there. When they got a percentage reduction, they came up with a figure that pushed you back to a reduction which, given your normal production load, would put you much higher. Is that what you are more or less saying?

MR. WHITESIDE: Mr. Stein, what I am saying is that they took the discharge and calculated backwards from what they figure the pounds, and said that our wastes were reduced by an average of, say 80 percent to the system.

Now, our normal thing over this period of time, since we have been running the oxygen in the system which started in June, we have had 83.6 percent reduction. Now, that is over the average of the whole period. And what the raw load of the system -- if you merely took the 7,000 that they had in the data -- from the data which was valid for that day -- would calculate back to a lower load as a raw material. So what I was trying to merely bring back for the record was to show what the raw load was on the average.

MR. STEIN: Fine.

Again, let me give you this, because this is one item that I think we have felt, with a lot of industries, we are over this hump. I would like to put this out here because I think this makes life easier for everybody. There is no substitute for full disclosure of information on all sides. I am not talking about trade secrets, or anything of that kind that particularly maybe the chemical companies are concerned about, but the kind of thing you put out in your discharge.

Now, this has come up again and again, and I have talked to our people about it. The reason they have made assumptions as they have on the field stations is all this industrial data wasn't available. If the data were made available -- and I think possibly this conference, if we did nothing else, we got your figure on 83 percent reduction and how you arrived at that, and that is a great thing to have -- but I think if industry would make this available to the State people and consequently to us when we check with the State on a routine basis, this will be folded into the reports and be the basis of any analysis that we have.

The difficulty that I find is time after time our investigators go out and they come up with a figure or a State investigator goes out and comes up with a figure, then an industry comes up and says your assumption is wrong; we actually do this, and this, and this. But that is only in response to our investigator. If you would say that in the first place, everything would have been cleared up, and I hope we can work on that basis in the future.

MR. WHITESIDE: We will work with you any way we can.

MR. STEIN: All right. Thank you.

Are there any further comments or questions?

If not, thank you very much, sir.

MR. THOMAN: Thank you much.

MR. STEIN: Again, I would like to indicate that this company in the past, as you can see, has done a considerable amount of work. They have complied with the Federal and the State recommendations in the past, and I look forward to the same kind of cooperation in the future. This is not a company that is just putting out untreated wastes.

MR. BECK: Are there any other people from Alabama that would like to make a statement?

Hearing none, Mr. Chairman, I turn it back to you.

MR. STEIN: Well, I think that Florida may have some more.

MR. REED: Mr. Chairman, I have notification of three more speakers from the State of Florida. I would like to ask first for Dr. Tom Hopkins of the University of Northwest Florida here in Pensacola, who has done extensive work on the Escambia River and Bay with his students, and I would like to commend him on his appearance here on behalf of the State and the great interest that has been taken by his students in this field, which I think is a very enlightened approach to the problems which we face in America.

T. S. Hopkins

STATEMENT OF THOMAS S. HOPKINS, ASSOCIATE PROFESSOR, BIOLOGY DEPARTMENT CHAIRMAN, UNIVERSITY OF WEST FLORIDA, PENSACOLA, FLORIDA

MR. HOPKINS: Mr. Chairman, Mr. Reed. Thank you for your introductory remarks.

I sat through the hearing yesterday and would have put these comments into the record yesterday except that I had an appointment back at the university. In today's forum, I would just like to offer some information, not necessarily in rebuttal, but I hope in enlightenment to some of the comments that were made yesterday.

First of all, I feel that I have some information that may be enlightening with regard to the comments on the efficiency and the operation of the Northeast Treatment Plant.

During November and December, I had a student under my direction who was working on coliform counts at some 13 stations in the bay. This study was initiated as the result of our participation with the Federal Government in the Escambia River project and Bay project, and the bacteria that I helped them collect at that time.

Unfortunately, during that period, the sampling was not sufficient for the Federal Government to include it in the report. I am not sure that the information I have is that much more sufficient, however, as I said, I think that with regard to the conferees, I think they may find it enlightening.

I am mindful of a lady that lives in the vicinity of the area who has phoned me with regard to the nature of the water in front of her house and the fact that her children, on several occasions, when swimming on her beach came out of the water covered with an oily-like material and brown stringy material. This is indeed a shock for a mother of a few children, and indeed I myself would be shocked.

We have some measurements from that area on those days. We did find depressed oxygen in the immediate vicinity. I will put these into the record and submit a formal report at a later time, within the two-week period.

Secondly, I would like to address some remarks to Mulat-Mulatto Bayou and some public statements that appared with regard to the fish kills being the result of spawning exhaustion.

For the public record, I would like to say this is preposterous. If two- or three-inch menhaden die of spawning exhaustion, then they have got a hormone that I don't know about yet.

Secondly, the habits of the Atlantic menhaden, Brevoortia patronus; and the Gulf menhaden, Brevoortia gunteri, are such that they spawn in the open Gulf of Mexico as rather adult fish.

I believe that will suffice on that point.

MR. STEIN: You punctured that. I was going to start selling menhaden oil!

MR. HOPKINS: Also for the record, I would like to include in the record for the conferees' examination and possible use some aerial photographs that were taken by me of the waters up in the vicinity of the Container Corporation. I realize I am introducing these as a little bit of a shock. I showed them to Mr. Crockett. I want them not necessarily to be included in the record, but as the old adage goes, "A picture is worth a thousand words." I think it may explain some of the picturesque problems that people have alluded to.

Another envelope contains a picture of what I consider to be a highly eutrophied pond near Brewton, Alabama. We flew over this pond as low as we could get within the FAA regulations, and it is my opinion that waters from this eutrophied pond do enter the Escambia

River and could be adding significant amounts of nitrogen and other things as a result, and I believe that perhaps the State of Alabama would look into this pond with the possibility of getting its owner to clean it up.

Lastly, I have some pictures of the St. Regis Corporation outfall taken on the same day, which may be instructive in tomorrow's report.

MR. STEIN: That is not in the hearing.

May we see those pictures if you want to put them in the record?

MR. HOPKINS: I will just give them to you as they are, and you can decide how they are best used.

Do you want to see them now?

MR. STEIN: Don't hold them in the envelope.

MR. HOPKINS: I would like to say that it is not my custom to provide information of this kind. On the other hand, the nature of them is such that -- they are a single photograph; they are not slides, and they can't be shown openly. As I say, the conferees can decide how they are best used.

With regard to the comments on the L&N bridge, I would like to say that during the next two weeks we will try and go out and get some physical measurements of the obstructive capacity of the bridge. For the public record,

(The above-mentioned photographs follow.)

490a

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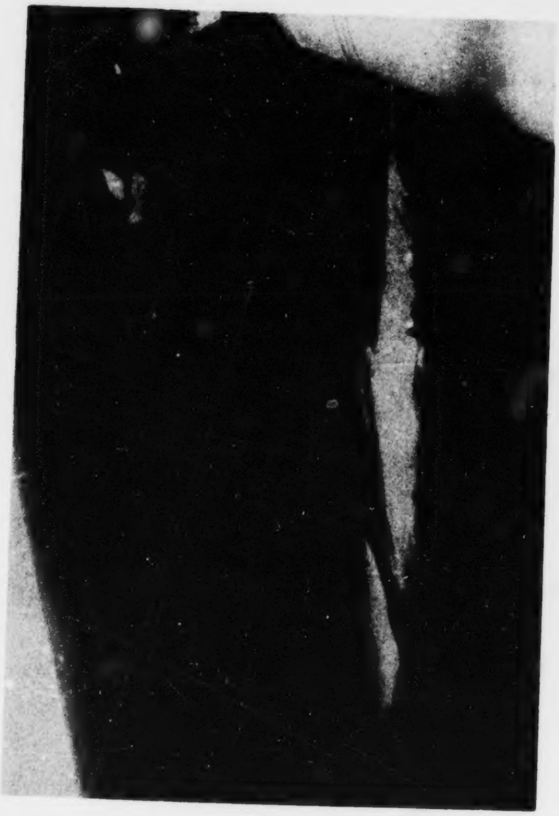

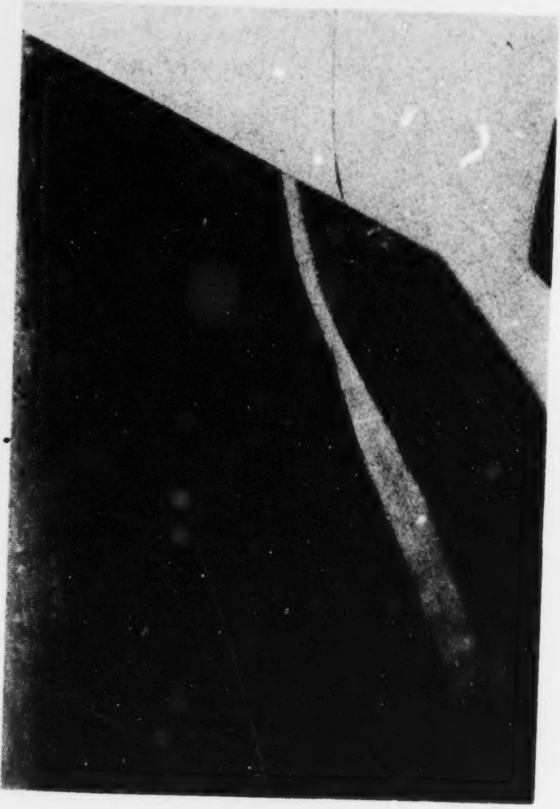

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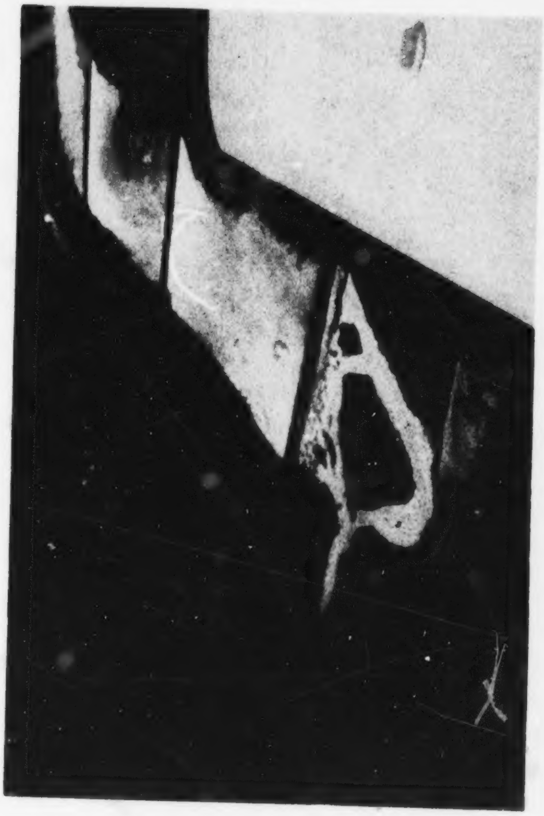

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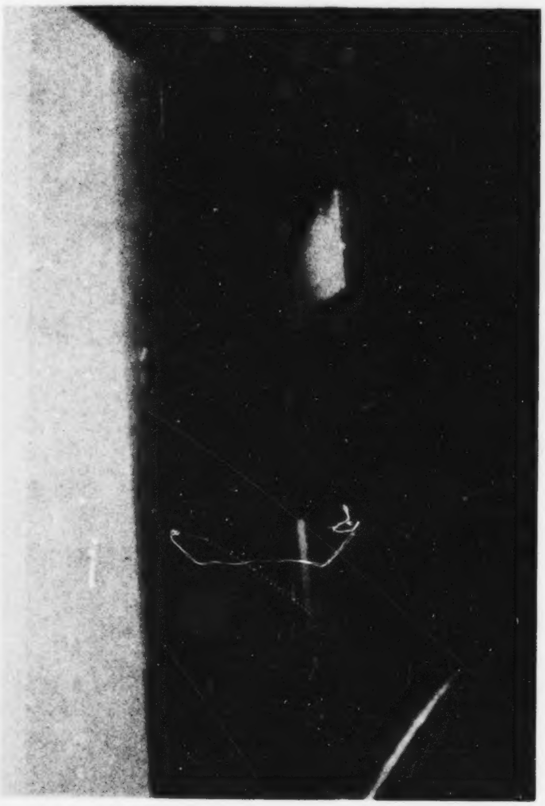

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T. S. Hopkins

I said at a joint legislative hearing that I felt one of the basic problems in the upper bay was a restriction of the circulation caused by the joint L&N and I-10 bridge, and I am personally happy that if by some possible means that be used to remove this obstruction.

I think it is possible that the nature of the obstruction may be more than 20 percent because there are submerged pilings that have been cut off historically and which are not visible to the eye. They are visible to the, fisherman who tries to go under the bridge and busts his motor.

I also will put into the record a quarterly report covering the period June 1 to September 30, the work that we have done in Mulat-Mulatto Bayou, if any of that information may be appropriate to the general understanding of conditions in Mulat during this overall period.

Last of all, I would like to say that I am very pleased that the university has been able to cooperate with the Monsanto Corporation, American Cyanamid, Escambia Chemical and the city of Pensacola, that my faculty is continuing and will continue to do this on a non paying basis, simply as helping in any way we can.

I had an opportunity to talk with Dr. Lackey,

(The above-mentioned quarterly report follows.)

who is going to work with Escambia Chemical and I hope he will share our facilities at the university, and that we, as estuarian scientists, can look for mutual solutions to our many problems.

MR. STEIN: Thank you.

Are there any comments or questions?

MR. PATTON: I would like to. Dr. Hopkins indicated there is more than 20 percent obstruction of the bay flow by the L&N piling bridge.

Could you clarify that?

MR. HOPKINS: It is just a personal opinion, and for the record I am going to go out and I am going -- we have got low tides right now -- to go measure the bridge, measure the pilings, and try to come up with the best, most accurate figure we can give. It may be only 5 percent, but I think that some physical figure may be helpful in this consideration.

MR. PATTON: Could you actually count some of these in places where they are submerged to see how many there are side by side under there?

MR. HOPKINS: Yes, we hope to do so at low tide.

MR. PATTON: I think that would help considerably.

MR. STEIN: Thank you.

Mr. Reed.

Quarterly Report

Bureau of Commercial Fisheries Contract No. 14-17-002-399

Principal Investigator: Thomas S. Hopkins, Associate Professor
Chairman, Faculty of Biology
University of West Florida
Pensacola, Florida 32504

Period Covered: June 1, 1969 to September 30, 1969

I. General

Activities under the provisions of the contract may be subdivided into:

1. Bi-monthly hydrographic sampling in Thompson's and Mulat Bayous.
2. Bi-monthly phytoplankton sampling in Mulat Bayou.
3. Bi-monthly macro-faunal sampling in Mulat Bayou.
4. Intensive investigation of fish kills in Escambia River and Mulat Bayou.

II. Hydrographic Study Mulat and Thompson's Bayous

Bi-monthly samples taken during the sampling period included conductivity-salinity, temperature, dissolved oxygen, and water samples for plankton, nitrate and dissolved carbohydrate analysis. Conductivity-salinity and temperature were measured in situ using a Beckman Model R-S-5 portable salinometer. Dissolved oxygen was determined by the standard titrimetric method (Winkler). Nitrate was determined by a modified Brucine method (Kahn and Brezenski, 1967). Dissolved carbohydrate was determined by the standard Anthrone method. The results of the above analyses are represented both graphically and in table form (See Fig. 3-10 and Tables 1-10). Phytoplankton was enumerated using a membrane filter technique, and are recorded in Table 11.

Beginning on July 3, we added stations 7, 8, and 9 which can be located using Figure 1 of Part II of Enclosure 1 ("The Escambia River and Escambia Bay During Summer 1969: A Report in Two Parts"). These stations have been added since studies showed that the two industries involved produced effluents that were having a direct effect on the Mulatto Bayou Study. Parenthetically, the Escambia River study has a very direct relationship on Thompson's Bayou.

III. Macrofaunal Sampling

A. General Activities:

Sampling of macrofauna was carried out on a biweekly schedule according to the following dates:

* June 4
** June 17
* July 8
** July 22
* August 5
* August 20
*** September 3 and 10
* September 24

* sites 2, 4, 6
** sites 2, 4 only
*** sites 2, 4, 6 but interrupted by weather

Sampling methods were as described previously. Additional sampling was carried out during "fish kills", wherein both dead and living macroinvertebrates were collected.

B. Results from Macrovertebrate Data:

Although we have collected a large amount of data on macrovertebrate arrival times and distributions, these data are still being sorted and put into "bar graphs" for the second quarterly report. During this quarter of activity, certain trends are evident.

1. Brevoortia patronus - This "Largescale Menhaden" was the dominant vertebrate species during June (often more than 90% of the sample) at sites 2 and 4 in the bayou. It was noticeably absent from site 6 outside the bayou. During July and August the numbers declined at site 2 and 4 but appear to increase in September.

From evidence at hand, it is certain that the fish killed on May 21, 1969 were not the same size range as those routinely sampled, i.e. they were non-residents. This kill occurred in the vicinity of the mouth of Mulatto Bayou and involved about 12,000 lbs of fish; 98% were menhaden with a size range of 60 - 90 mm S.L. Menhaden collected on May 23 were of a size range 30 - 45 mm S.L. Although we believe that two populations by size class are involved, this has not been established beyond question. Assuming that our collections are representative it can be proposed that the larger size class is apparently more sensitive to the low oxygen conditions than are the smaller fish.

2. Mugil cephalus - "Striped mullet" appears to be the second most demonant species of fish in the bayou. The mean standard length (S. L.) of the samples increased from 48.2 mm to 104.4 mm during the reporting period. The largest numbers reported occur

consistently at site 6, although it is common in the bayou proper. It is higher in number at site 4 than site 2. Analysis of data at hand should show whether these are discrete populations.

3. *Cyprinodon variegatus* - The "Sheepshead minnow" was very common at site 4 and an abundance of young in the samples may indicate that spawning may occur in the adjacent marshes.

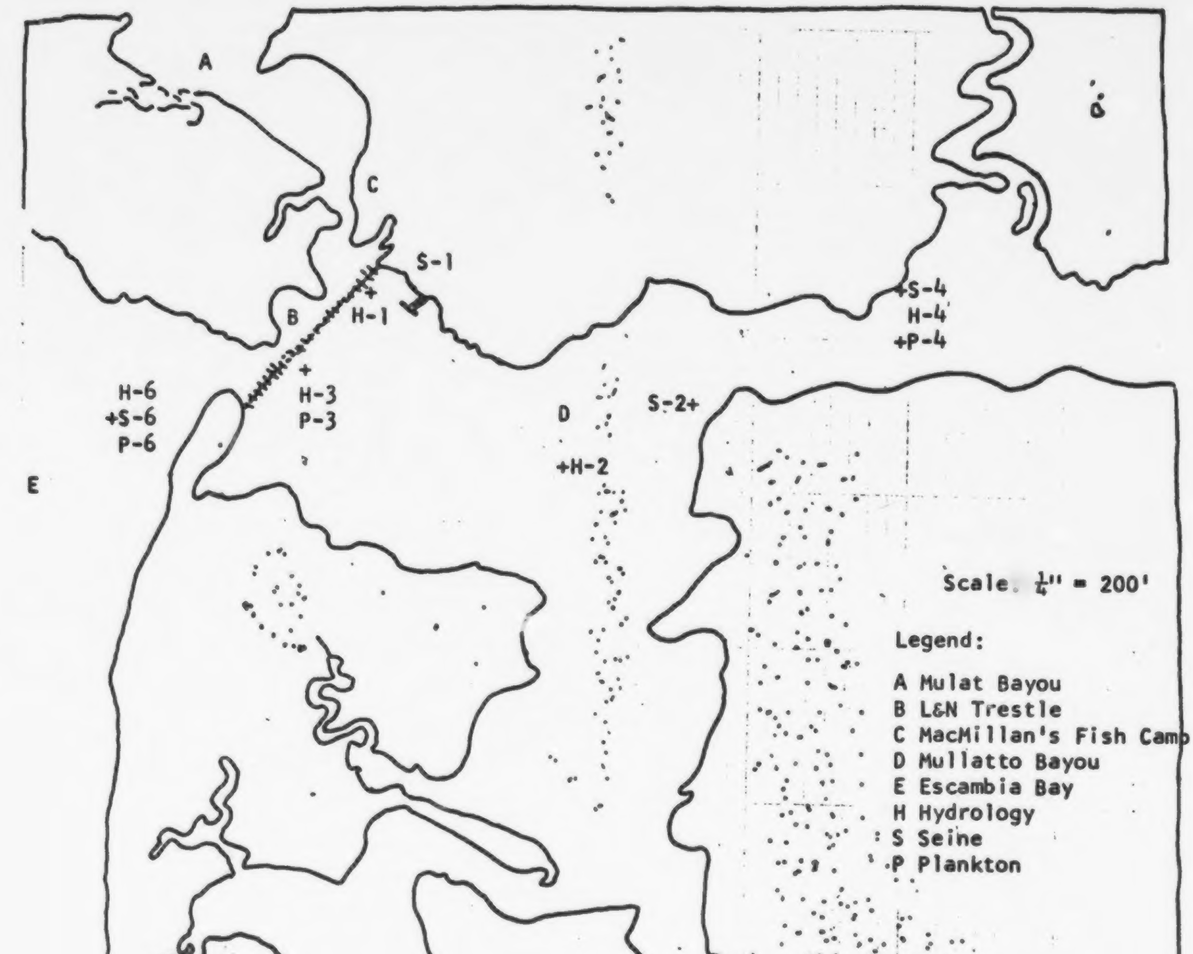
4. *Anchoa mitchelli* - The "Bay anchovy" is beginning to make its appearance by being the dominant species in September samples.

To date, the following fish species have been represented by larvae and juvenile stages in Mulat Bayou.

Dorosoma pretenense
Brevoortia patronus*
Anchoa mitchilli*
Bagre marinus
Galeichthys felis*
Cyprinodon variegatus
Micropterus salmoides
Oligoplites saurus
Bairdiella chrysura
Cynoscion nebulosus
Leiostomus xanthrus*
Micropogon undulatus*
Lagodon rhomboides
Prionotus sp.
Scomberomorus maculatus
Mugil cephalus*
Paralichthys lethostigma

* Young of these species appeared in the study area as post-larvae and juveniles in numbers (greater than 25% of sample) that indicate the importance of the study area as a nursery ground. The other species, while still extremely common, have not been represented by a significant (25%) portion of any one sample.

FIGURE 1


A
C
S-1
+
H-1
B
+S-4
H-4
+P-4
+
H-3
P-3
H-6
+S-6
P-6
D
S-2+
+H-2
E
Scale: ¼" = 200'
Legend:
A Mulat Bayou
B L&N Trestle
C MacMillan's Fish Camp
D Mullatto Bayou
E Escambia Bay
H Hydrology
S Seine
P Plankton
H-5
+
P-5

Mulatto Bayou
Sampling Stations

Figure 2

Thompson's Bayou
Sampling Stations

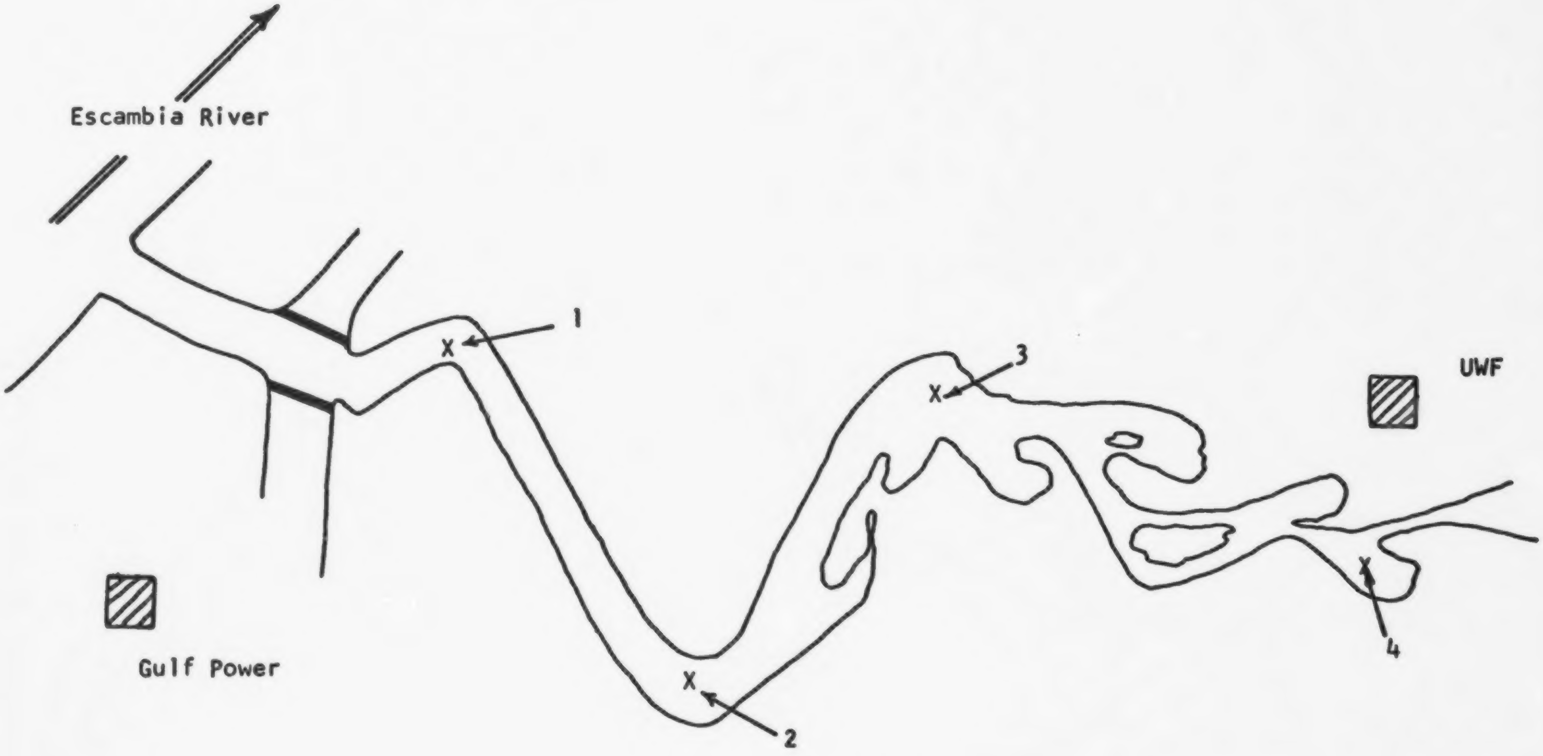

Escambia River
1
3
UWF
Gulf Power
2
4

Figure 3

Dissolved Oxygen
Mulatto Bayou

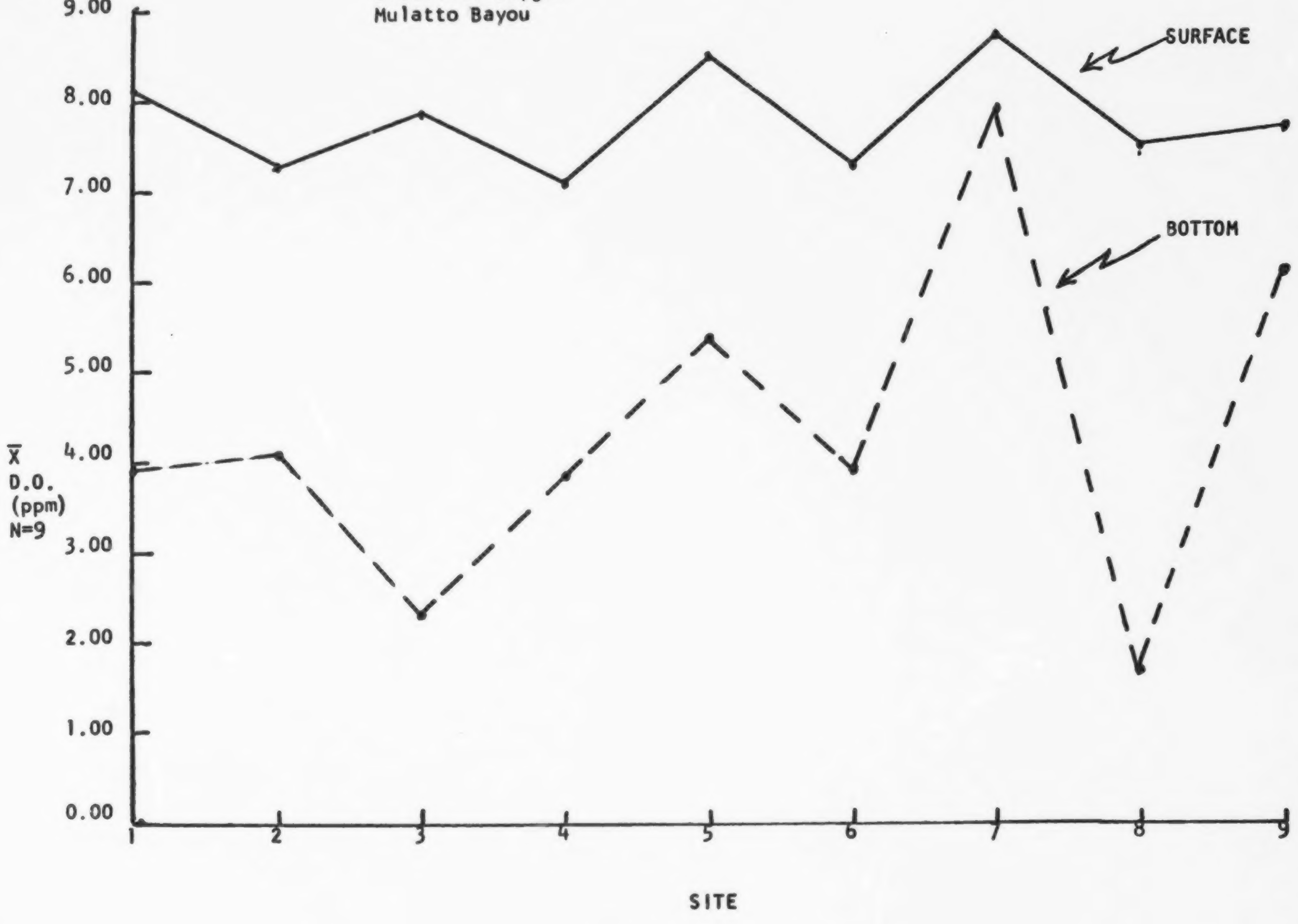


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Figure 4

Inorganic Nitrate
Mulatto Sampling

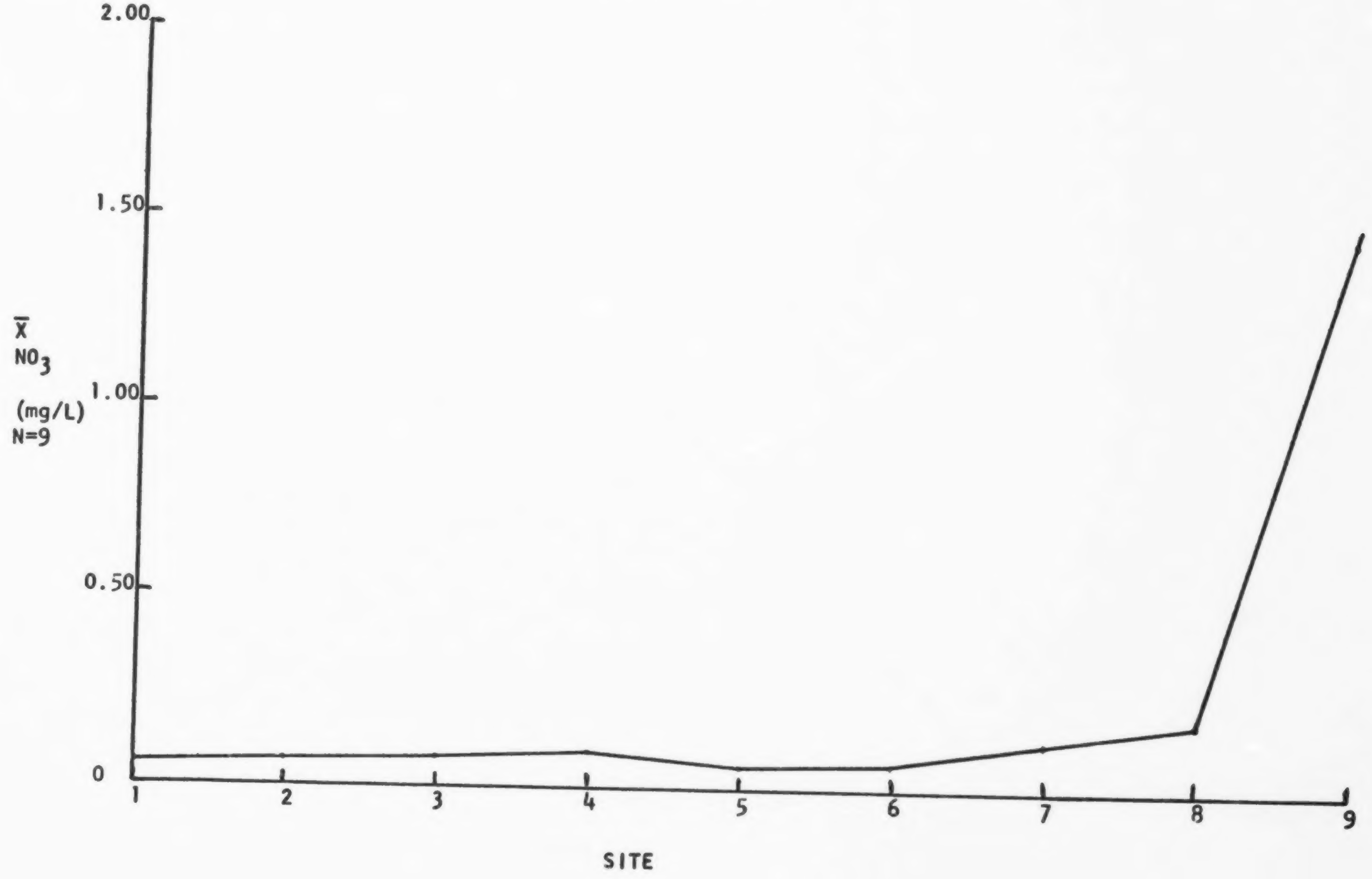


Figure 5

Dissolved Carbohydrate
Mulatto Sampling

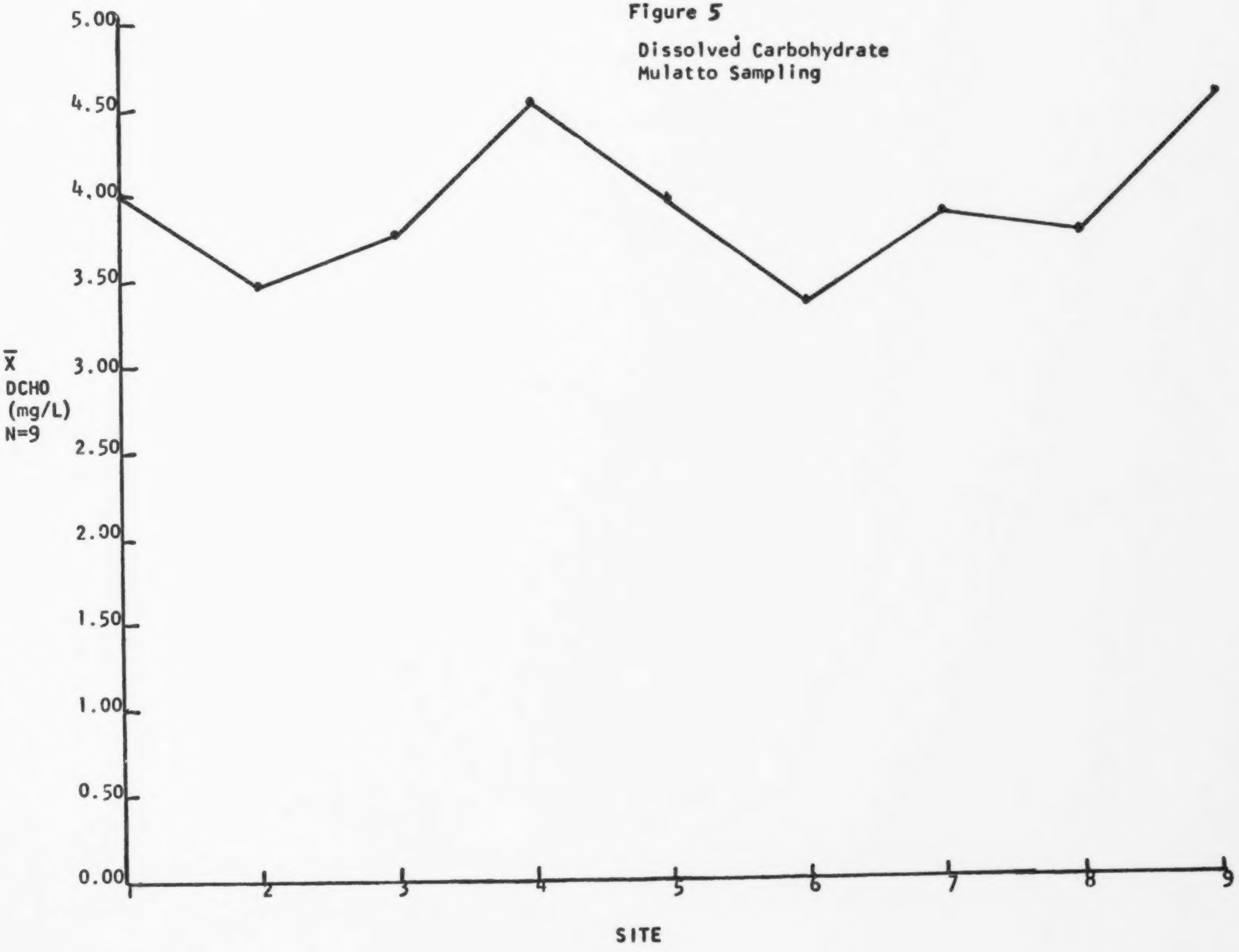


Figure 6

Secchi Depth
Mulatto Sampling

492J

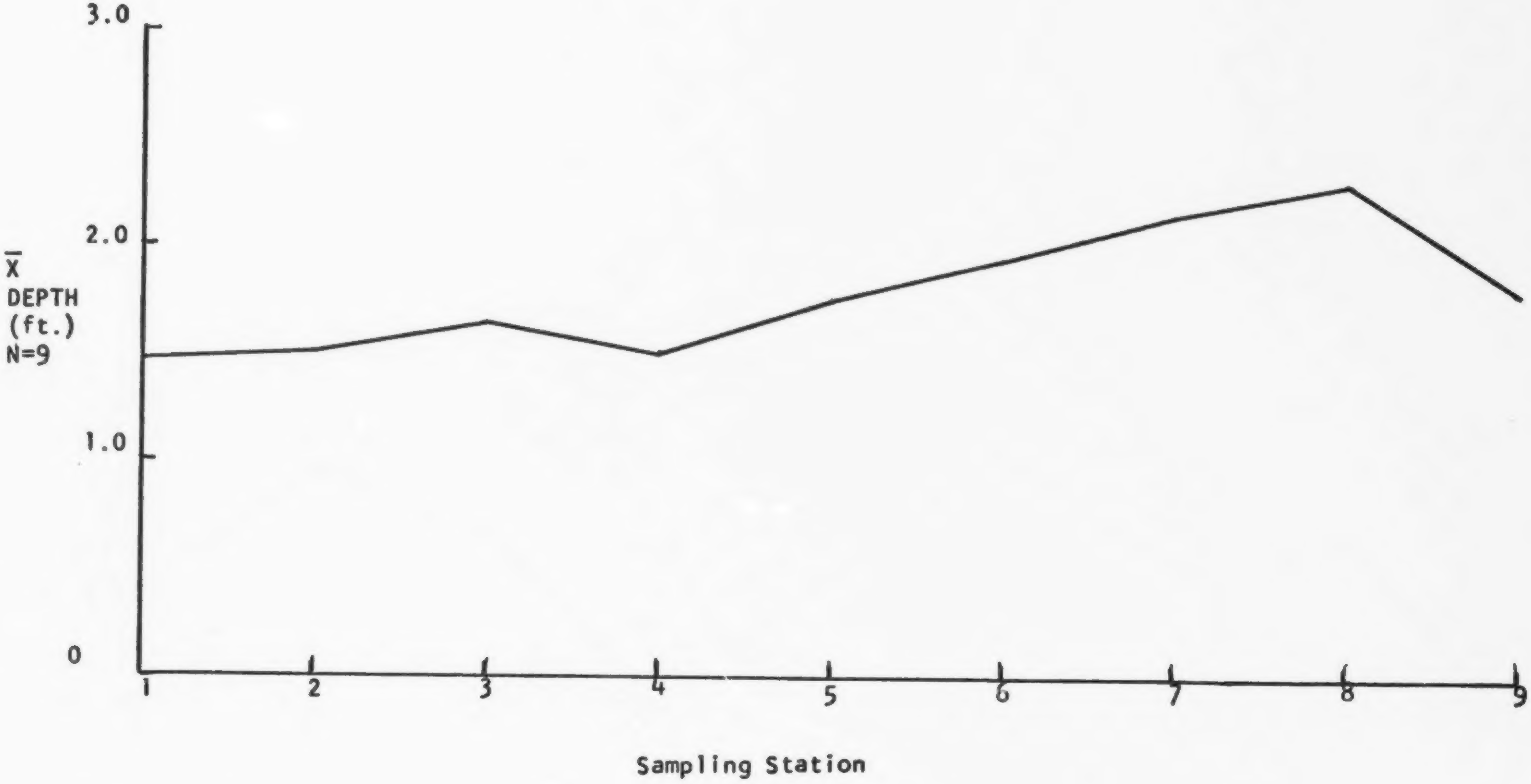
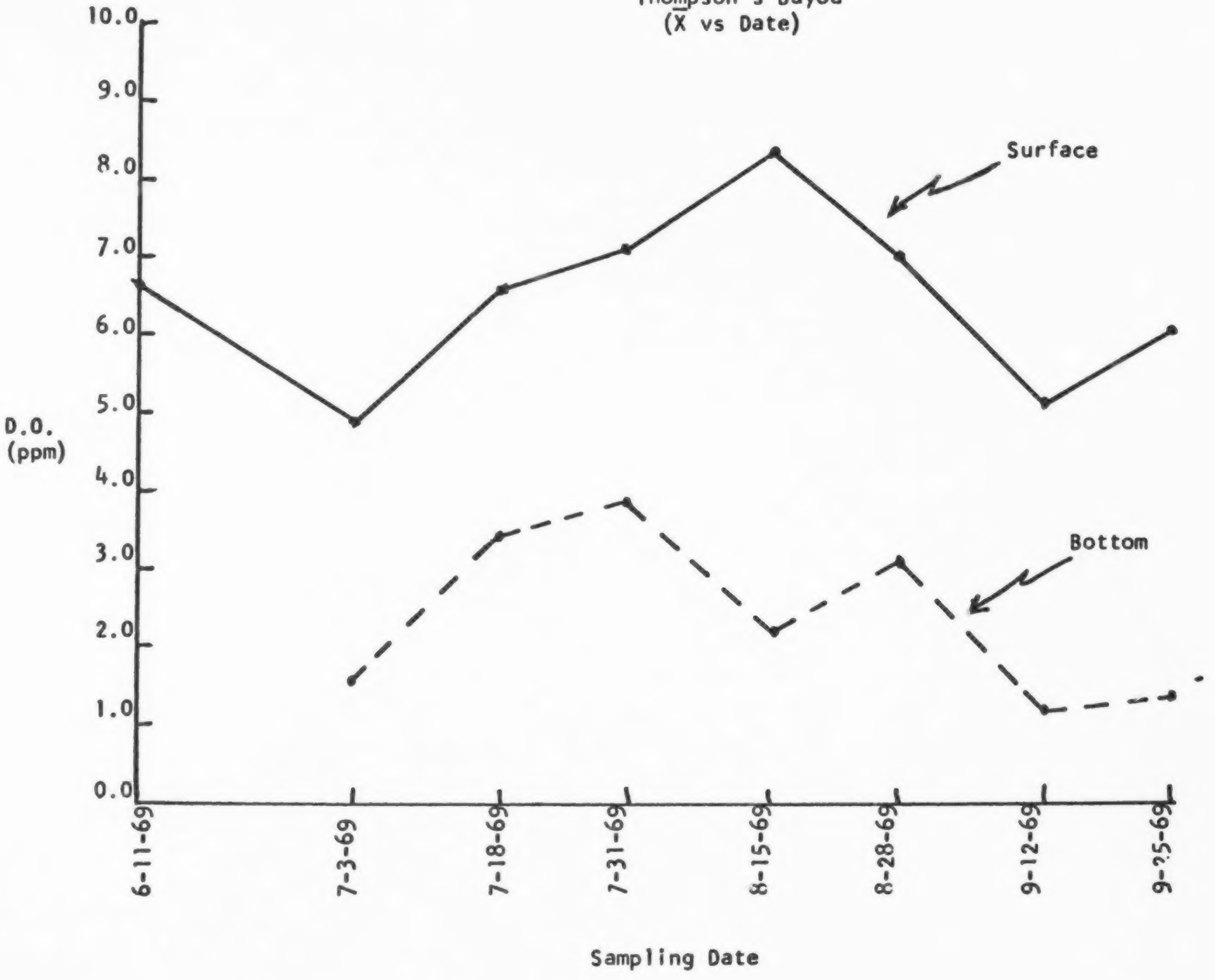


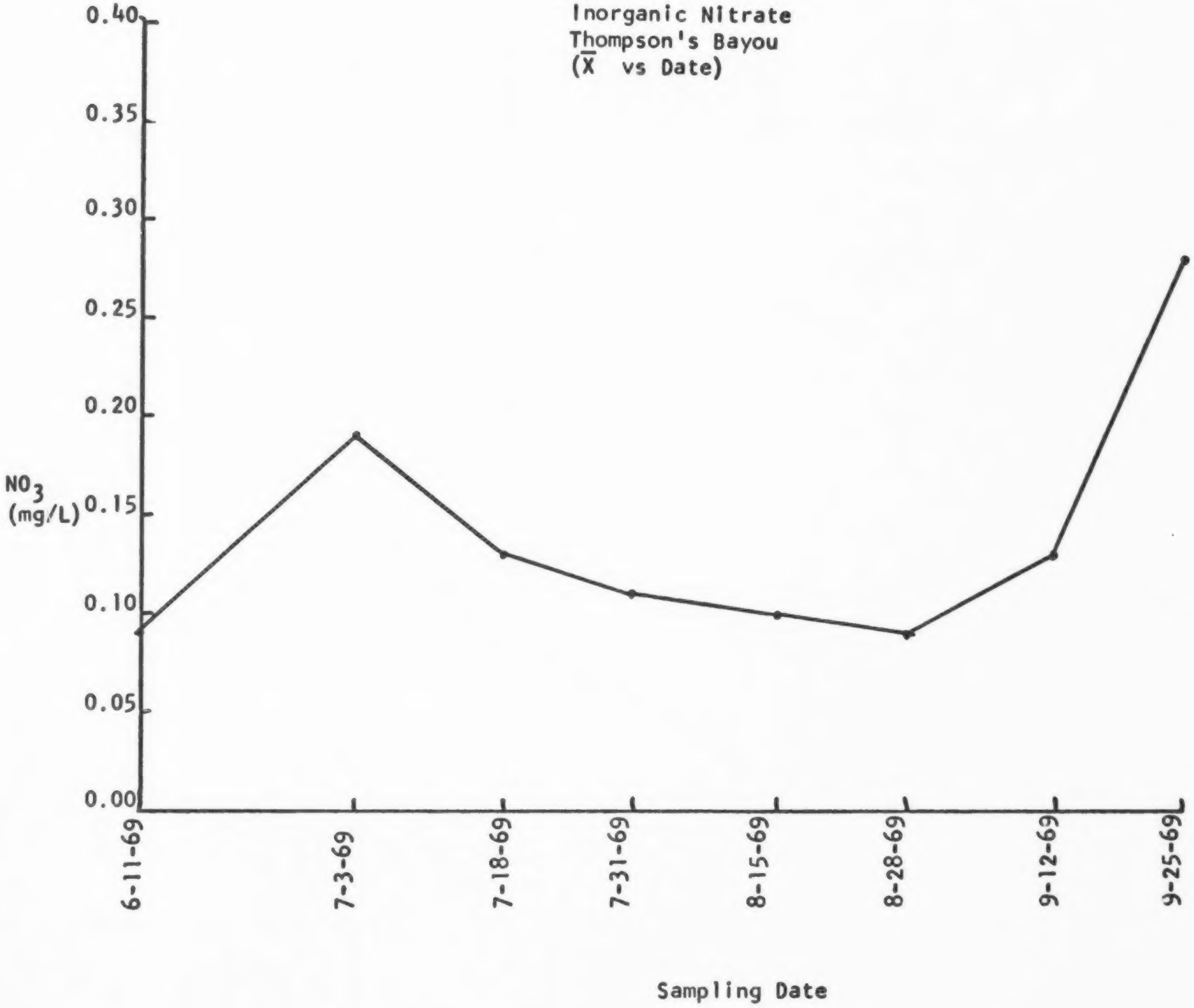
Figure 7

Dissolved Oxygen
Thompson's Bayou
($\bar{X}$ vs Date)



492K

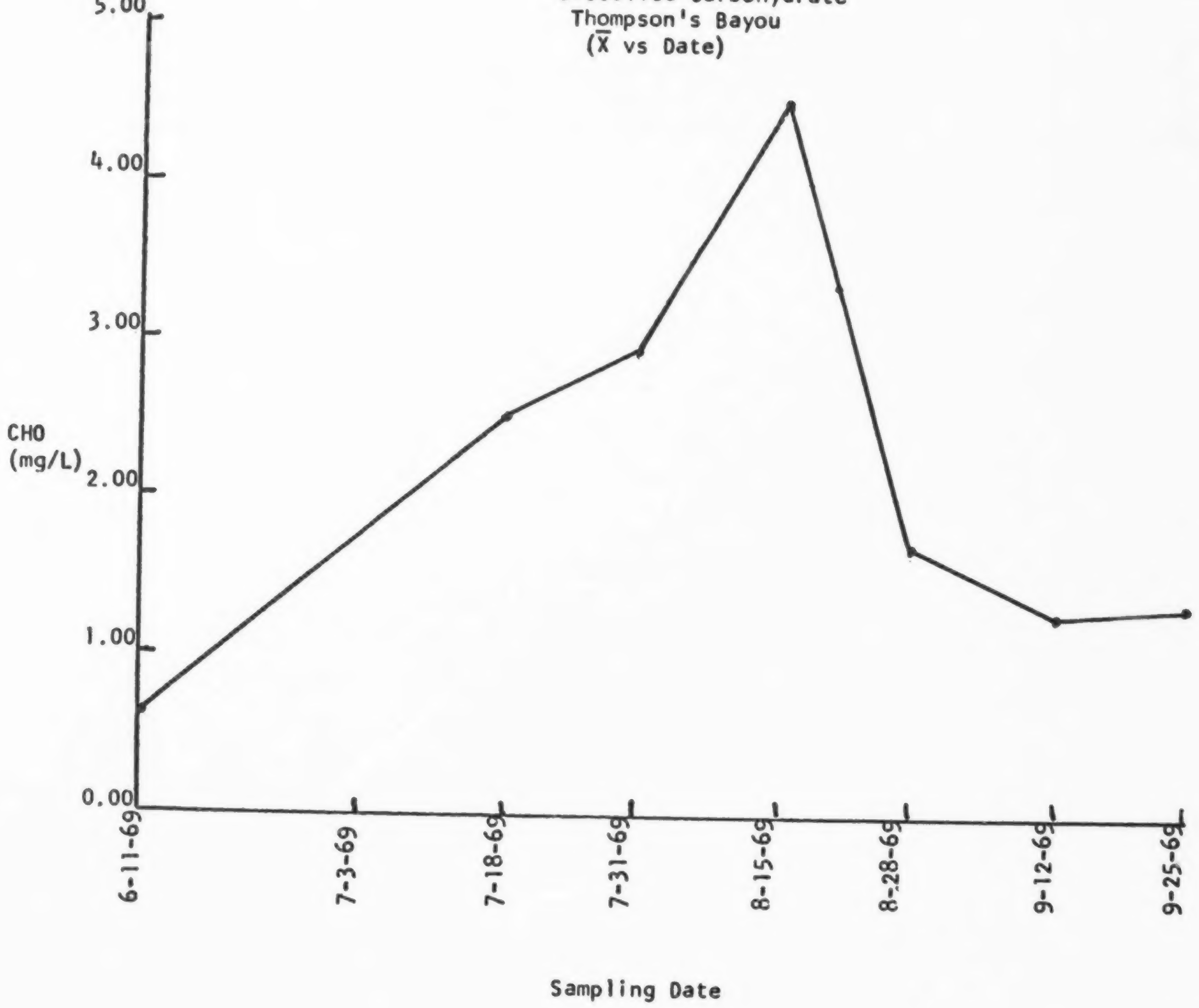
Figure 8



Inorganic Nitrate
Thompson's Bayou
($\overline{X}$ vs Date)

Figure 9

Dissolved Carbohydrate
Thompson's Bayou
($\overline{X}$ vs Date)



492M

Figure 10

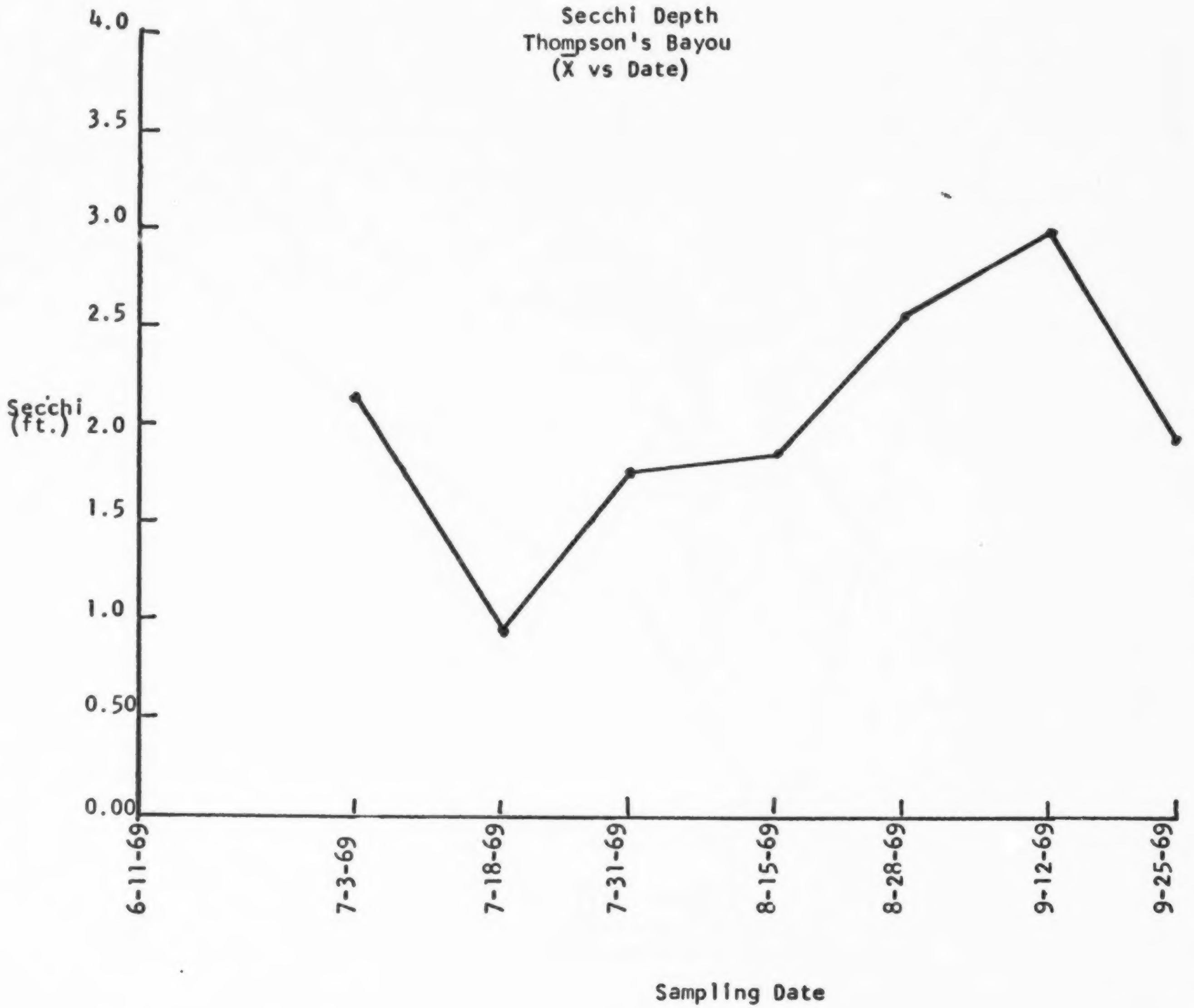

Secchi Depth
Thompson's Bayou
(X̄ vs Date)
Secchi (ft.)
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.50
0.00
6-11-69
7-3-69
7-18-69
7-31-69
8-15-69
8-28-69
9-12-69
9-25-69
Sampling Date

TABLE I

Mulatto Bayou/ Salinity - Temp

S=Salinity(0/00)
T=Temperature(°C)

SAMPLING DATE		1 S	1 B	2 S	2 B	3 S	3 B	4 S	4 B	5 S	5 B	6 S	6 B	7 S	7 B	8 S	8 B	9 S	9 B
6-4-69	S	8.71		9.88		8.79		8.50		7.80		11.27		---		---		---	
	T	27.23		26.99		26.51		26.22		26.77		27.74							
6-13-69	S	11.96		12.04		12.28		11.40		12.80		12.74		---		---		---	
	T	31.07		29.98		30.62		31.32		30.13		29.75							
7-3-69	S	----------(Salinometer in repair)----------																	
	T	33.0	---	33.0	---	33.0	---	33.5	---	34.0	---	33.0	---	33.0	---	32.5	---	34.0	---
7-18-69	S	1.45	6.75	1.21	8.30	1.00	9.74	0.09	7.39	4.86	7.84	1.23	9.05	3.38	3.47	3.56	4.77	1.97	1.97
	T	24.95	25.75	25.03	25.90	24.93	26.20	24.88	25.80	25.53	25.68	24.83	25.95	26.25	26.13	26.35	26.47	26.22	26.13
7-31-69	S	2.98	3.80	4.59	4.69	3.79	5.92	2.93	4.05	6.95	7.77	4.91	4.93	4.01	4.39	4.13	4.26	1.00	1.15
	T	31.04	30.67	30.71	30.33	31.70	29.05	31.39	29.39	31.30	30.86	30.91	30.91	30.26	30.26	30.17	29.85	29.81	29.81
8-14-69	S	9.16	13.70	9.54	13.81	8.72	15.62	9.62	13.12	9.37	17.21	10.50	15.30	9.38	9.43	9.18	16.74	10.79	11.67
	T	28.72	29.14	28.63	29.31	29.72	29.60	28.88	29.30	28.35	29.31	28.72	29.72	29.00	29.01	28.85	29.68	28.50	28.40
8-28-69	S	8.22	8.26	8.41	10.80	7.61	14.29	8.02	12.20	9.51	9.64	9.49	14.33	5.92	6.02	5.42	12.53	---	7.55
	T	30.25	30.29	29.75	29.32	30.20	29.06	29.78	28.98	30.55	30.52	29.84	29.79	29.84	29.86	29.74	29.20	---	31.03
9-11-69	S	14.66	18.85	14.73	16.48	14.22	19.82	13.29	16.34	13.88	24.20	15.88	19.75	18.78	21.46	18.62	23.56	---	20.32
	T	26.58	26.44	26.24	25.38	26.32	25.64	26.60	26.26	25.72	26.80	26.23	25.70	26.53	27.10	26.64	27.24	---	26.39
9-29-69	S	18.14	18.65	18.36	18.35	18.42	22.16	18.05	18.05	17.70	22.70	20.41	22.34	---	10.73	9.70	23.67	---	17.88
	T	27.70	26.84	27.86	26.50	27.55	27.16	27.54	27.46	26.74	26.83	26.88	26.93	---	26.76	26.63	26.78	---	29.58
X̄ (salinity)		8.66	11.67	9.85	12.07	9.35	14.59	8.99	11.86	10.36	14.89	10.80	14.28	8.29	9.25	8.33	12.38	4.96	8.88
X̄ (temperature)		29.25	28.19	28.35	27.79	28.95	27.78	28.90	27.86	28.78	28.33	28.66	28.16	29.15	28.94	28.69	28.21	29.64	28.54

492 0̄

492 P

TABLE 2

Mulatto Bayou/ Dissolved Oxygen (ppm)

Station Number

SAMPLING DATE	1		2		3		4		5		6		7		8		9	
	S	B	S	B	S	B	S	B	S	B	S	B	S	B	S	B	S	B
6-4-69	8.29		7.08		7.99		6.63		8.83		7.23							
6-13-69	9.71		7.22		8.99		7.84		8.86		6.56							
7-3-69	7.15	1.95	7.65	2.94	7.82	1.18	7.71	3.81	10.03	4.78	8.10	1.62	8.34	5.41	7.71	1.18	6.11	1.65
7-18-69	5.79	2.80	5.92	3.81	3.84	2.75	5.04	2.82	8.02	5.84	5.26	2.53	5.70	4.29	6.62	2.67	5.86	5.70
7-31-69	8.14	7.92	7.07	6.21	9.10	2.02	7.36	5.10	9.01	8.56	8.96	9.33	11.10	10.99	9.62	2.61	7.78	7.47
8-14-69	6.91	1.31	6.78	1.63	6.96	0.72	4.78	0.72	7.79	2.74	6.19	0.65	6.44	4.72	7.19	0.84	5.88	1.05
8-28-69	11.91	4.01	9.69	2.96	10.89	2.22	9.90	6.08	9.95	9.64	11.44	7.13	12.11	11.75	11.93	0.86	11.84	11.86
9-11-69	6.83	4.00	6.41	5.45	6.20	3.97	5.88	3.50	5.00	3.50	5.80	3.69	11.01	10.24	3.34	1.73	8.99	8.99
9-29-69	8.58	5.87	7.59	5.17	8.69	3.61	9.02	4.66	9.20	2.54	6.60	2.54	6.70	---	6.45	1.61	7.45	---
X	8.15	3.98	7.27	4.02	7.83	2.35	7.10	3.81	8.52	5.37	7.35	3.93	8.77	7.90	7.55	1.64	7.69	6.12

TABLE 3

Mulatto Bayou/Nitrate (mg/L)

Station Number

SAMPLING DATE	1	2	3	4	5	6	7	8	9
	S	S	S	S	S	S	S	S	S
6-4-69	0.02	0.02	0.02	0.02	0.00	0.02	---	---	---
6-13-69	0.02	0.02	0.02	0.026	0.022	0.022	---	---	---
7-3-69	0.059	0.037	0.059	0.037	0.079	0.057	0.183	0.173	1.72
7-18-69	0.11	0.11	0.12	0.29	0.05	0.09	0.22	0.15	1.96
7-31-69	0.17	0.13	0.16	0.18	0.10	0.15	0.13	0.19	0.19
8-14-69	0.05	0.05	0.05	0.06	0.07	0.06	0.11	0.10	0.86
8-28-69	0.02	0.13	0.11	0.15	0.10	0.10	0.15	0.28	0.53
9-11-69	0.03	0.02	0.03	0.05	0.03	0.02	0.03	0.32	1.77
9-29-69	0.03	0.02	0.03	0.02	0.01	0.02	0.07	0.07	2.89
$\bar{x}$	0.057	0.060	0.067	0.093	0.051	0.060	0.123	0.183	1.417

492Q

TABLE 4

Mulatto Bayou/DCHO (mg/l)

	Station Number								
SAMPLING DATE	1	2	3	4	5	6	7	8	9
6-4-69	2.30	3.00	3.10	4.80	2.70	1.60	---	---	---
6-13-69	4.65	2.30	3.80	3.90	3.20	1.90	---	---	---
7-3-69	2.40	2.30	2.50	2.40	3.10	2.10	5.20	2.60	2.90
7-18-69	5.30	4.50	5.30	6.10	4.20	4.00	2.60	3.50	3.80
7-31-69	3.55	2.27	2.10	2.73	1.64	2.73	1.73	2.55	1.82
8-14-69	5.75	5.75	4.25	7.13	9.87	5.62	5.62	4.88	5.12
8-28-69	3.94	1.88	2.94	2.81	2.70	3.12	3.12	3.31	4.12
9-11-69	4.43	5.84	6.28	5.84	4.43	4.00	4.40	3.40	4.70
9-29-69	3.66	3.56	3.66	5.00	3.77	3.33	3.66	3.33	9.22
$\bar{X}$	4.00	3.49	3.77	4.52	3.96	3.16	3.66	3.72	4.53

TABLE 5

Mulatto Bayou/Secchi (ft.)

	Station Number								
SAMPLING DATE	1	2	3	4	5	6	7	8	9
6-4-69	1.5	1.75	1.5	1.5	2.25	2.0	---	---	---
6-13-69	1.25	1.50	1.50	1.0	1.50	1.5	---	---	---
7-3-69	1.75	1.75	2.25	1.75	1.75	2.50	2.25	2.50	1.75
7-18-69	1.25	1.50	1.5	1.75	1.5	2.0	2.5	2.5	2.0
7-31-69	1.25	1.25	1.5	1.25	1.75	1.75	1.75	2.0	1.50
8-14-69	2.25	2.0	2.25	2.0	2.0	2.0	2.25	2.5	2.0
8-28-69	1.50	1.25	1.50	1.25	1.75	2.0	---	---	---
9-11-69	---	---	---	---	---	---	---	---	---
9-29-69	1.0	1.0	1.0	1.5	1.5	1.75	2.0	2.0	1.75(Bottom)
$\bar{X}$	1.47	1.50	1.63	1.50	1.75	1.94	2.15	2.30	1.80

492T

S=
T= } See Table 1

Table 6

Thompson's Bayou/ Salinity - Temp

Station Number

		1				2				3				4				*			
Depth		S	1m	2m	3m	S	1m	2m	3m	S	1m	2m	3m	S	1m	2m	3m	S	1m	2m	3m
SAMPLING DATE																					
6-11-69	S	.74	1.18	4.00	14.20	.76	.92	3.44	6.22	.26	1.78	2.90	14.30	.10	.20	2.62	3.32	.46	1.02	3.24	9.54
	T	28.44	27.32	26.88	26.55	28.82	28.36	27.53	26.28	26.16	27.50	26.74	25.60	28.12	25 04	24.70	24.52	27.35	27.22	26.46	25.72
7-3-69	S	Salinometer not working----------																			
	T	31.0	--	--	--	31.0	--	--	--	30.5	--	--	--	28.5	--	--	--	30.25	--	--	--
		S			B	S			B	S			B	S			B	S			B
7-18-69	S	.14			.12	.05			.13	.07			.41	.05			.05	.07			.18
	T	25.23			23.87	25.01			23.97	24.50			24.00	24.48			23.65	24.80			23.85
7-31-69	*C	.09	.10	.07	--	.07	.07	04	.04	.07	.07	05	.05	.04	04	03	--	.07	.07	.05	.05
	T	28.52	26.61	25.17	--	28.94	26.77	25 23	24.72	29 03	25 95	25.10	24 77	28 57	25.77	24 49	--	28.77	26 23	24 99	24.75
8-15-69	S	.44	--	--	2.0	.24	--	--	.58	.14	--	--	1.45	.04	--	--	.00	.22	--	--	1.01
	T	30.1	--	--	27.68	29.78	--	--	25 0	28.86	--	--	25.4	27.2	--	--	24.28	28.93	--	--	25 59
8-28-69	S	.08	.08	.00	.00	.10	.08	.08	.21	.12	.11	.10	.61	.08	.12	.12	.30	.10	.10	.07	.28
	T	26 37	24.61	23.55	23.00	25.66	25.16	24.00	23.75	26.90	26.20	24.67	24.33	26 18	25.75	24.51	24.23	26 27	25.43	24.14	23 82
9-12-69	S	.77	--	--	12.50	.49	--	--	14.28	.30	2.01	--	--	.19	--	--	(4m) 4.05	.44	2.01	--	10.28
	T	23.65	--	--	27.83	23.37	--	--	27.91	23.15	24.12	--	--	22.33	--	--	25.16	23.12	24.12	--	26.96
		S			B	S			B	S			B	S			B				
9-25-69	S	.92	--	--	5.36	.92	--	--	8.98	.46	--	--	8.68	.03	--	--	4.23	.58	--	--	6.81
	T	25.54	--	--	25.67	26.96	--	--	25.52	25.72	--	--	25.75	24.34	--	--	24.26	25.64	--	--	25 30
*conductivity																					
Average	S	.45	.45	1.36	5.60	.38	.37	.119	4.35	.20	.99	1.02	4.25	.08	.12	.92	1.99	.28	.80	1.12	4 02
	T	27.35	26.18	25.20	25.77	27.44	26.76	25.58	25.30	26.84	25.94	25.50	24.97	26.22	25.52	24.52	24.35	26.89	25.75	25.20	25 14

Table 7

Thompson's Bayou

Dissolved O_2 (ppm)

Station Number	1		2		3		4		$\bar{x}$	
	S	B	S	B	S	B	S	B	S	B
Sampling Date										
6-11-69	6.80	--	6.91	--	6.39	--	5.60	--	6.41	--
7-3-69	3.41	.63	2.98	.63	5.18	.63	8.06	4.80	4.93	1.67
7-18-69	6.42	4.08	6.53	3.31	6.62	1.44	6.50	5.09	6.52	3.48
7-31-69	4.98	3.90	8.30	4.02	7.23	2.98	8.26	4.62	7.19	3.88
8-15-69	4.58	3.31	8.39	78	10.49	.37	9.91	4.45	8.34	2.23
8-28-69	9.03	4.59	8.29	6 28	5 33	1.33	5.48	.59	7.03	3.19
9-12-69	5.90	.60	6.00	2.70	5 15	1.40	4.00	.40	5.26	1.26
9-25-69	6.09	.70	10 26	1.53	8.41	1 77	6 09	1 75	6 19	1.44
Average	5.90	2.54	7 21	2 32	6.85	1.42	6 74	3 10	--	--

492 4

492 V

Table 8

Thompson's Bayou

NO_3 (mg/l)

Station Number	1	2	3	4	$\bar{x}$
Sampling Date					
6-11-69	.08	.08	.07	.12	.09
7-3-69	.22	.22	.22	.08	.19
7-18-69	.15	.12	.11	.13	.13
7-31-69	.16	.11	.09	.07	.11
8-15-69	.21	.05	03	.05	.10
8-28-69	.03	.06	.13	.14	09
9-12-69	.05	.06	15	.27	.13
9-25-69	.30	.20	.37	.26	.28
Average	.15	.11	.15	14	--

Table 9

Thompson's Bayou

Dissolved Carbohydrates (mg/l)

Station Number	1	2	3	4	$\bar{x}$
Sampling Date					
6-11-69	.5	.3	.6	8	.6
7-3-69	?	?	?	?	?
7-18-69	1.9	3.7	2.0	2.4	2.5
7-31-69	3.10	2.27	3.27	3 00	2.94
8-15-69	3.62	6.25	4.25	3.88	4.50
8-28-69	1.6	2.53	2.06	1.73	1.62
9-12-69	1.0	.90	1.40	1.50	1.20
9-25-69	2.66	lost	.90	1.66	1.35
Average	1.96	2.65	2.06	2.13	--

492W

492X

Table 10

Thompson's Bayou

Secchi (ft.)

Station Number	1	2	3	4	$\bar{x}$
Sampling Date					
6-11-69	?	?	?	?	?
7-3-69	3.0	2.5	1.75	1.25	2.13
7-18-69	1.0	.75	1.0	1.0	.93
7-31-69	1.5	1.75	2.0	1.75	1.75
8-15-69	2.5	1.75	1.5	1.5	1.85
8-28-69	2.5	2.5	2.5	2.75	2.56
9-12-69	3.0	3.0	3.0	3.0	3.00
9-25-69	1.0	1.25	2.25	3.25	1.93
Average	2.07	1.92	2.00	2.07	--

Table 11

SUMMARY OF PHYTOPLANKTON INFORMATION FROM MULAT BAYOU

June 4 to September 28, 1969

DATE	SITE	#/ml TOTAL ORGANISMS	PENNATE DIATOMS	CENTRIC DIATOMS	FLAGELLATES*	NOTES	X̄ OF TOTAL ORGANISMS SITE 3&4	TOTAL ORGANISMS SITE 6
June 4'69	3	370	5	15	350**	Armoured, Flagellates identity not yet established	355	330
	4	340	5	5	330**			
	5	50	0	0	50**			
	6	330	10	25	295**			
June 14'69	3	40	0	5	35	*tiny, Gym. & armoured **+1 Goniaulax	63	55
	4	85	20	10	55*			
	5	36	0	0	36**			
	6	55	0	5	50*			
June 30'69	1	50	5	0	45**	*Tiny, gym. & armoured **Tiny & gymnodinium *** Gymnodinium		
	2	30	5	0	25*			
	3	60	0	5	55*			
	4	45	5	10	30**			
July 3'69	1	35	0	5	30*		35	55
	2	35	0	0	35*			
	3	30	0	5	25***			
	4	40	0	10	30*			
	5	60	0	0	60*			
	6	55	0	5	50*			
	7	60	0	5	55*			
	8	50	0	5	45**			
	9	55	0	5	50*			
July 18'69	1	190	0	0	190***		243	155
	2	120	0	0	120***			
	3	291	0	0	290*	*desmidaceae Cosmarium		
	4	195	0	0	195***			
	5	125	0	5	120***			
	6	155	5	0	150***			
	7	120	0	5	115**			

492Y

492 Z

Table 11—Continued

SUMMARY OF PHYTOPLANKTON INFORMATION FROM MULAT BAYOU

June 4 to September 28, 1969

DATE	SITE	#/ml TOTAL ORGANISMS	PENNATE DIATOMS	CENTRIC DIATOMS	FLAGELLATES*	NOTES	X OF TOTAL ORGANISMS SITE 3&4	TOTAL ORGANISMS SITE 6
July 18'69	8	275	0	0	275**			
	9	205	0	0	205**			
July 31'69	1	200	0	25	175***		190	230
	2	190	0	45	145**			
	3	215	0	50	165***	→ w/5 - *Ceratium*		
	4	165	25	20	120**			
	5	380	0	20	360*	→ w/5 - *Ceratium*		
	6	230	10	50	170*			
	7	585	20	250	315*			
	8	345	5	45	275**			
	9	185	0	40	145**			
Aug. 14'69	1	125	0	0	125**		798	1075
	2	795	0	15	780*			
	3	681	10	15	656**	→ w/1 Goniaulax		
	4	915	35	25	855*			
	5	2066	0	15	2051**	→ w/1 Goniaulax		
	6	1075	0	35	1040**			
	7	875	5	35	840**			
	8	1135	0	35	1100*			
	9	1280	0	45	1235*			
Aug. 28'69	1	1400	155	90	1155*		1355	2150
	2	1705	25	105	1570*			
	3	880	10	10	870**			
	4	1830	40	30	1760**			
	5	1770	115	85	1570**	→ w/5 Goniaulax		
	6	2150	40	15	2095**	→ w/20 Goniaulax		
	7	6350	170	10	6170**	→ w/5 Goniaulax		
	8	5625	55	145	5425**	→ w/35 Goniaulax		
	9*	contains bloom of unidentified algae, at best guess - blue-green not counted because of vast #'s and minute size of organisms.						
Sep. 11'69	1	1245	25	35	1185**		1260	1710
	2	1960	50	25	1885**			

DATE	SITE	#/ml TOTAL ORGANISMS	PENNATE DIATOMS	CENTRIC DIATOMS	FLAGELLATES*	NOTES	X OF TOTAL ORGANISMS SITE 3&4	TOTAL ORGANIS. SITE 6
Sep. 11'69	3	995	5	30	960**			
	4	1525	25	20	1480**			
	5	680	20	25	635**			
	6	1710	10	50	650**			
	7	2175	15	20	1140**	# w/15 Ceratium		
	8	1360	30	5	1325**			
	9	1870	50	60	1760**			

J. Blanchard

MR. REED: Mr. Blanchard, from the Game and Fresh Water Fish Commission, has asked to state again a continuation of his discussion yesterday on the Escambia River.

MR. BLANCHARD: We would like to thank you for this opportunity to amend our previous statement concerning the Escambia River.

It has come as somewhat of a shock to learn that the Escambia River itself is not considered polluted, rather it is a mode of transportation by which Escambia Bay has become polluted.

Reports published periodically by the State Board of Health from 1962 through 1968 show a dramatic lowering of the biotic index in the upper river. This reduction is especially evident in the 1968 report. In this biotic index, it shows that generally since 1964 that area, Station 1 at Highway 4 has declined from a biotic index of 40 to somewhere in the neighborhood of a biotic index of 10 at the present time.

At the Upper Bluffs Station, it is reduced from about 30 to about 15. This is generally more evident when you come into the White River, and Monsanto area.

Fish population sampling data, while admittingly not statistically valid, points to a sizeable decrease in

J. Blanchard

the standing crop over the past 12 years. It is important to note that fish do not survive only on the average but they must also survive on days of spills and peak loads as well. Fishermen success and man day's usage has decreased yearly. Fewer boats now utilize the river and, as can be seen by the Federal reports, the reduction of rental boats is in the neighborhood of 50 percent. A number of fish camps have gone out of business. During the past year, several trips were made between the Highway 90 bridge and Brewton, Alabama. The most fishermen counted on any one trip was seven. That figures to slightly over one fisherman to every 10 miles of stream.

Several different bacteria and diseases were isolated from fish of the Escambia River. The most prevalent was Columnaris, described by Auburn University as being a secondary infection, quite possibly resulting from pollution aggravation. This was a similar syndrome to that which caused huge sores on the fish of Escambia Bay.

In rivers similar to the Escambia, such as the Choctawhatchee, when game fish numbers have decreased, rough fish have multiplied so that relatively the same poundage is maintained. The Escambia appears to be an exception, an indication all species have decreased

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proportionately.

Gravel wash operations in the past have clouded Big Escambia Creek, and the Escambia River to the point where eggs spawned would soon be smothered as layer after layer of silt built up.

Aquatic vegetation that was once abundant in quiet sloughs and along some banks is now completely gone except for one small patch of lily pads approximately one mile upstream from Monsanto. This aquatic vegetation is especially valuable to the ecosystem. It provides havens for small fish, food for those fishes that feed on invertebrates, and spawning areas where the plant roots have maintained a hard bottom. Vegetation serves to stabilize the bottoms and the river banks and prevents much of the physical shifting of the upper river. Vegetation also removes from the water the nutrients we are all so concerned about and at the same time adds oxygen to the water.

I would be one of the first to admit that conditions have changed for the better. The gravel wash operations have ceased to be a problem. Some problems such as a change in land use practices from timber to agriculture can never be corrected, and an apparent increase in fisherman success in the Molino to Monsanto area during the past summer has been noted.

At the same time, we believe that the color imparted to the water by Container Corporation is responsible for the disappearance of the vegetation, and in conjunction with other polluters of the Brewton area is at least in part responsible for the decline in the fish population, this being primarily a stress placed on the sight feeders.

We agree with the conclusions of the FWPCA report and recommend they be implemented most expeditiously.

MR. STEIN: Any comment or question?

I just have one. You raised a new point here. This Columnaris -- we have generally found that associated with raising of temperatures.

MR. BLANCHARD: That is true. Also Columnaris is probably more widespread than I think we ever thought it was. Most fish -- in fact, all fish that were recovered from the Escambia River had Columnaris disease.

MR. STEIN: Well that may be, but I think it was part of the report that dealt with high temperature rises, and recommendations of reduction of temperature, and, again -- and we like to call on the fisheries' biologist for that -- but it has been my experience in various pollution cases in the country that when you are talking about temperature pollution -- and, by the way, I should say -- let me go off the record on this.

(Discussion off the record.)

MR. STEIN: Back on the record.

Where we have Columnaris, the first thing you look for is artificial increases in temperature showing this great increase, and I think that is a significant point.

Thank you very much.

Mr. Reed.

MR. REED: The last speaker we have is the distinguished Vice-President of Region 3, Florida Wildlife Federation's representative, Mr. A. Ray Richards.

STATEMENT OF A. RAY RICHARDS, VICE-PRESIDENT, REGION 3, FLORIDA WILDLIFE FEDERATION, AVALON BEACH, FLORIDA

MR. RICHARDS: Mr. Chairman, and ladies and gentlemen, I would like to give a layman's view on this. I have clubs throughout northwest Florida from Eastern Tallahassee back to Perdido Bay, which gives a bad taste in anybody's mouth to say; also the Eleven Mile Creek. They say it would take 30 years to be able to retain any life here again.

A. R. Richards

But I would like to bear especially on the Escambia River. I have a club in the northern part of Santa Rosa County that the people -- some of them that belong to the club have been fishing in this river since the turn of the century. I know that people get up here with boards and show pictures, and with letters that are written, and make you believe white is black, but you can't tell those individual people down there that the sun is up whenever it is midnight and make them believe it, because they fished in that river, as I say, since the turn of the century, and now the only fish they can get is where a new creek is coming into the river. Then, whenever that is dropped into the grease, it is such a state, and it is such a stench until they take it and throw it away. There is no fish up there that is fit to eat.

That used to be a good productive river, and I would like to say on behalf of the findings of the river, up until right recently, the Health Department didn't give us much help. The Jay Club wrote to Congressman Bob Sikes. He would write a letter to the Health Department. They would write one back, and then they would say: There is nothing wrong with it.

I went over and called on the Congressman and

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I told him he was being unjustfully judged because he is depending on that, and that he should call on the Game and Fresh Water Fish Commission, which has also made a survey on that river, of which I had asked our regional director to have a survey made about 3 years ago, just before the present one came into office, and this survey would show the true matter of what that river is.

I understand -- I am just going to call what I have been reported to and what I was told by a law officer that their mobile unit up there was open to the Container Corporation employees when they had their trailer upthere in order to make this survey. It seemed to me like any data like that should be brought before a board before it is put to any company.

I would like to say that the Florida Wildlife Federation don't look just for the present for fishing and hunting and to try to preserve these things, it is for the sons and the future generations, not just for a now project.

This Jay Club, as we went on to Congressman Sikes and put him onto what was going on -- very shortly the news started spreading, and things started being done. Now, I will have to say that he is one of the best conservationist public officials we have in this area, and I will come on down to another club here in Pensacola -- it is the Hunters and Protective Association, that have been active for a good many years -- I know of 15 or more. And they go up and down the Escambia River, and they hunt deer; they hunt fox; they have many dogs, and I wouldn't be too afraid to put one of them up against Mr. Joe Crockett's predecessor on the tracking, even though Joe don't claim it came to him, or it may be the other way around -- I don't know.

The deer on the river are not. These fellows can track deer, and they go up and see if there has been any tracks near the river, and they were amazed -- "there must not be any deer here." Well, they started going up the side of the creeks. The only sign they could see was the doe, the bucks' and the fawns' tracks. They would go to the creeks to drink. They wouldn't drink out of the river; it is not fit water for anything.

In fact, at one of our meetings up at Jay, one of the Container Corporation men was there, or somebody, talking on their behalf, and he mentioned, "Well, that water is so clear when it comes out of there, I drink out of it."

The fellow in back said, "Yeah, you probably drink moonshine; that is no sign fish will live in it."

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But that river -- you get in an eddy place or in a lick just off of the river where it has had a chance to settle, you start up your kicker on your boat, you have to get out of there, you can't stand the stench, and the long, stringy, mossy-looking stuff in the water. That river should be compared, as Joe said, to the Choctawhatchee or Yellow River as to coloration, and so forth.

Now, that is not a fast flowing river, or not a lot of water in the river unless it has been raining up north of here. You take whenever you go across the bridge up at Brewton -- I have seen it dry enough weather until you hardly get your ankles wet going across there.

I went to all of the meetings whenever this better water, and so forth, started in southern Alabama, that I could possibly get to. I called the director, and I got one of his men to go to the others, to Ozark, Dothan, Andalusia, Bay Minette, Mobile. I have been amazed to find out that over the period of years, other than some of the major towns all along the borderline of Florida are putting out pure untreated raw sewage with a few of them doing a secondary type filtration, and all of the rivers coming down through there -- in fact, we have to take what comes out of Alabama whether we like it or not. It comes down into our rivers, out of our estuaries, across our State, and it looks to me like they could settle for maybe if they clean up Perdido Bay, or something, that they would have to clean up the other waters coming down through here. It looks like there could be an arrangement made instead of making beautiful pictures that we know that is what they are there for. If they couldn't make those beautiful pictures and write those beautiful letters to whitewash things, they would get somebody to do it, because they are paid and I am not. That is the difference in the jobs.

Now, they kept talking yesterday about their theoretical calculations. Well, I guarantee anybody that wants to get in a boat -- any of you gentlemen -- and to go up in above Highway 4 and go on up towards the creek that dumps that stuff out into the river -- there won't be anything theoretical about it. It will be in front of your eyes, and the stench, if you can stand it. You better take a mask.

I would like to come on down the river a way and -- you were talking about the bay yesterday -- I live on Mulatto Bayou, the very controversial bayou. I know that backwards and forwards, and I have spent a lot of time in that bay. I seen Dr. Hopkins out there while he was running around in a put-put, and I agree that

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that bridge is taking more than 20 percent, and his findings will find that out. There are very few of those pilings that has ever been removed since 1909 when that bridge was put across there. I know they stopped up the Mulatto Bayou. It is lower there than it is on the bay, and there was boats up the bayou that tried to buy them off -- so few of them, they couldn't. One of them, they came down and brought their rig and picked it up and put it over the trestle after it was made, and after they saw there was no chance of keeping it open. Two of them stayed there, and they say they are still in the mud today.

Well, I want to see Congressman Bob Sikes possibly if he could help us out getting this railroad lifted so it is -- at least cruiser boats could get under it, I mean, or even run-arounds with a windshield, and he was of the opinion that that would be a pretty hard thing to do, being the Federal Government is helping out the railroad as much as they are, that we should find an alternate way.

As you heard the statement yesterday, that we blasted part of that in order to get into the bay, well, I took up a collection -- got a man from the DuPont Motor Company -- no, it was Hercules Company -- and he told me how to blast that mud. We opened up a place at high tide so that we could get in and out of Mulatto Bayou, and at low tide we could get out under the trestle. Well, we had a start. But then the Highway Department came along and at one of our hearings they tried to get a bigger canal opened up. A Highway man was there and they were going to do their digging on the south side of the fill of where the Interstate was supposed to be.

Well, he got up and informed us that they would change that for our benefit and dig on the north side. Well, in doing this -- I want to put this in, as somebody was talking yesterday about that -- they only allowed pumping there to open that up.

Well, now, I don't know what percent the water is, but I know a lot of it is mud, just silt, and that is what it did. They pumped 12 feet off of the top in order to get to the lower sand, and in pumping this 12 foot off of the top, they pumped it over in an area where it went back to our bayou about a mile above -- half a mile to a mile above -- and closed off this bayou.

Well, we thought we was going to get an out. The State Department wrote, then, this last summer, agreed to open that up, being it got closed in building the I-10.

Now, we had a meeting with Dr. Hopkins at

Avalon Beach about a month ago, and we agreed to let this stay closed for him to make a survey and see what this deep water -- they pumped it out something like 52 feet, but it has been filled back in since then to a certain extent -- and so we want to keep this on record and to keep the Highway Department noticed, and in another 4 or 5 years, if it is feasible, to open that up again if Mr. Hopkins and the Water Pollution Board don't think that it caused any severe damage. Because I have been under the impression that if we had a gut through there to float that matter on through instead of it sitting there, getting there and settling to the ground, that it would be better than if it had a gut to wash it on through and wash it on out as the tidal goes out.

Well, we will go along with Mr. Hopkins on that and not try to cause any fuss about it.

The Escambia Bay now -- like so many of the companies yesterday was reporting that they had not done any damage to the bay -- I have been in that bay casting nets, wading to my waist all up and down there. I call that part of my relaxation and a workout, like some people getting out on the golf range driving a ball around, and the mullet and the fish -- there used to be 40 to 50 boats out there on Saturday mornings, and in cold weather fishing for special -- we call them weak fish, in some areas -- they usually come in after the first cool spell. Now, you see no boats out there, and as the days come along, I could see that water north of the trestle getting more solids in it, getting filled up with green material and all kinds of trash, when south of it, there was -- looked very nice.

Well, right now you won't find that grass that stands about 6 inches to a foot above the water out in through Escambia Bay, south of Highway I-10 and the trestle, where when it come out to 100 and 150 feet into the bay before, where snails and other small sea insects that would get on that the fish enjoyed eating, and the grass that they had played in -- this grass has receded back to the shore. There is no more grass there, and hardly any fishing on the trestle. There used to be a lot of sheephead.

Now, talking about moving the trestle -- that would be good for the water, to have better flow. I have been there when that tide would change quick. There would be as much as 4 inches difference between the north part of Escambia Bay and the south part. There would be a fall really at that trestle, and there is sheephead around that trestle -- a lot of them -- used to be -- and I don't know as the people would go for that too much, but if we can get rid of some obstruction and it will help, we are ready to go all of the way.

Thank you very much, sir.

MR. STEIN: Thank you, Mr. Richards.

Are there any other --

MR. REED: There is one more request by Mr. Charles Gifford, Associate Professor at the University of West Florida, Biology Department.

MR. THOMAN: While he is coming up, I would like to make one comment for the record, Mr. Richards, that the Federal Government lives in a glass fishbowl, and as we collect data, it is available to anyone on an enterprise basis at the time it is collected. The raw data in this report have even been given to Mike Albertson of the newspaper here in town prior to the time that it showed up in the report. We do not release interpreted data, such as the report of this type, until it has received the various technical and policy clearances that it must go through. But data collected in the Mobile laboratory -- if Container Corporation requested that data, it was given to them, and it would be given to you or anyone that came in and asked for it.

STATEMENT OF CHARLES GIFFORD, ASSOCIATE PROFESSOR, BIOLOGY DEPARTMENT, UNIVERSITY OF WEST FLORIDA, PENSACOLA, FLORIDA

MR. GIFFORD: Mr. Stein, members of the panel. I just would like to ask some questions that occurred to me during the discussion yesterday. I would like to say at the outset though that while I am a member of the Biology Department at the University of West Florida, I do not represent or speak for them in any way, and that I have not been associated directly with Dr. Hopkins' project, and speak only as a concerned individual.

During the hearing yesterday, it seemed to me that the people involved attempted to -- in responding to the report -- attempted to discredit it in a way or reduce its impact by finding specific errors in the data, and I would like to say some things about some of these.

In one instance, Mr. Kenngott said that his analysis had shown only 30 parts per million of acrylonitrile in the effluent water and none in the surrounding water, and contrasted this to Mr. Traina's finding of 100 parts per million in a single grab sample. I understood that a grab sample applied and that perhaps the reason for the discrepancy was that they were analyzing two different things. Is that true?

MR. TRAINA: No.

MR. GIFFORD: It was water?

MR. TRAINA: It was water.

MR. GIFFORD: Okay.

And then, even so, though, while Mr. Traina took only one sample, and Mr. Kenngott apparently had many, he didn't give the range, and whether that was a minor --

MR. STEIN: Well, again, let me try to answer this. I hope we are going to be able to solve that question on acrylonitrile because, as was pointed out, we have spectroscopy, gas chromatography tests. That is very expensive. I wouldn't like to pull the string and do it, but if we have to engage in that and want to find it, I guess we are going to have to do it, but the results may be very startling. I hope we can come to an agreement without having to go through that, because if we do, we are going to follow through.

MR. GIFFORD: It occurred to me also that some organics are absorbed sometimes on suspended organic matter or suspended inorganic matter and can be kept out of the water that way and into the mud --

MR. STEIN: Well, again, if we are going to be pushed to it, and we can't come to an agreement on that, we are going to have to turn our most sophisticated methods of analysis loose. This is why we are here, and I think, in good measure, this is why Mr. Reed and certainly Governor Kirk asked us in because they recognized we had these resources in order to follow through, and we are prepared to submit to these if we have to do it.

What I ~~hope and what~~ I am hoping for, with the attitude of the companies as I heard it, is that we will be able to cut through a lot of this, and hopefully be able to come up with a program that we can all agree on.

MR. GIFFORD: Another instance was, or another question was about the fish survival. I wondered what sort of fish, and for how long, and how many fish. It may be that you could find one fish which would live in it -- one very resistant one -- in this mixture of 75 percent effluent and 25 percent bay water, but the critical thing is the most sensitive -- that there may be many other fish which no longer can live in that. Certainly that part of the upper bay and Mulatto Bayou are a nursery for juvenile or immature fish, and other things like shrimp and crabs.

MR. STEIN: That is the same kind of answer.

Again, we have had it, and it isn't unusual that people poke at this but -- are you in the Biology Department?

MR. GIFFORD: Yes.

MR. STEIN: You probably -- I don't know -- but you know we have Dr. Mount and Dr. Tarzwell both on our staffs, one of them in marine biology, and one in fresh water biology. These people are internationally recognized. They are the best people, I think -- among the best people in the country on fish assays and testing, and if we have to do this, again, their services are available and they will be brought in to check this out.

Now, we noted these points, and I think you are doing a service by bringing them up, but I would hope we would be able to resolve this without getting these people in. What I hesitate to do is bring our international experts into a particular situation unless we have absolute need for it and have to proffer it. But if we have need for it, they are going to be down here.

MR. GIFFORD: Well, my concern was that the overall impression of the conference that the public might get might be altered or weakened by these apparent discrepancies that the corporations have been able to point out in the data in the report. If you can disprove one thing, the whole thing might collapse or could be cast in doubt.

MR. THOMAN: Dr. Gifford, let me express what Mr. Stein has said in a little bit different way.

We have, in our Athens laboratory, the finest spectrometric laboratory in the southeast. I just want to tell you what we have. We probably have one of the two or three finest soils physical chemists in the world in the person of Dr. George Bailey, complete with X-ray detractometers and everything else.

If we have to unleash this barrage of scientific talent to prove a case, we will do it. What Mr. Stein says is that the willingness that the companies have indicated to cooperate in this yesterday, that this is hopefully not going to be necessary.

MR. GIFFORD: Well, I had a series of other points like that, but --

MR. STEIN: Well, you can bring them out because I think you are doing a service to everyone by pointing these out.

I would like to make one generalized notion. I don't want to make a judgment that the points raised by the companies were invalid, but I think the question here is: there are three ways we are going to come up with any disputed point: either the Federal report is correct, or the Federal investigators; or either it has been demolished on a particular point by a rebuttal; or else we are not quite sure and you want to do some further work to get a definitive answer to the question.

Now, I think the purpose of this, and what you are doing, is to zero in on the differences. If industry or anyone else feels that these differences are so fundamental at this time that they can't go along with the program and the Federal people feel that these are necessary for the case, and it isn't apparent that the evidence in the report is going to do it, as I have indicated, we are just going to bring the results out to get this abundantly clear one way or the other what the evidence is. But my experience has been that when we do that the implications of that are tremendous.

Let me just give you one point where we had to do it and spend a million dollars. This was in the pulp and paper industry in the Pacific Northwest. The pulp and paper industries steadfastly -- and this wasn't one company -- all of the companies -- said that the pulp and paper wastes weren't harming the oysters, and we went out and it took us several years, and we spent a million dollars on that, and I think it was pretty conclusively indicated that there was a direct relationship and correlation between the presence of pulp and paper waste and concentrations, and the mortality of the oysters. However, once we did this, we had a landmark case.

I think the pulp and paper companies in the Pacific Northwest are going along. But in addition to that, we were able to use that information in Penobscot, Maine, and based on that, one of the companies stopped pulping operations up there, and in various other places in the country.

So, in a sense, our work and the kind of material we have to get is in response to the resistance we might get from a discharger who doesn't want to go along with a voluntary program.

What I would hope to do is if we can get a voluntary agreement and compliance, we can throw our technical people into areas to find problems which are not solvable at the present time.

I only hate to put our investigators into projects, and particularly the top research and scientific people that we have in the country into projects that I call proving the obvious; but if we have to, we are going to.

MR. GIFFORD: Yes.

MR. STEIN: Right.

MR. GIFFORD: Mr. Law, for instance, made a strong point, or an issue of the discrepancy between his discharge figures and the figures reported in the -- or included in the report, and said that all of the total amount accredited to his sewage disposal plant was based on this erroneous discharge figure, and I wondered where the FWPCA people got their figure or how?

It seemed to me that the only one who would know the discharge of that plant would be the people who ran it, or that they would know most accurately. I wonder how Mr. Traina's figures were obtained, or his single figure of a million gallons per day.

MR. STEIN: Do you want to answer that?

MR. TRAINA: Information was provided by the Pensacola office of the Florida State Board of Health and Rehabilitative Service.

MR. GIFFORD: They seemed like the only people who would really know.

MR. TISDALE: I object. That is an incorrect statement.

MR. STEIN: Sit down. Sit down.

I tell you we have a procedure. If anyone feels that they have anything to say, they can come up in an orderly fashion, but you know the difficulty with anonymous voices from the audience, they don't get recorded. If you have something to say, come up in this bright light, identify yourself and we will let you speak.

Go ahead, sir.

MR. GIFFORD: The point occurred to me -- and I hadn't been aware of it or considered it before -- was that the statements were made yesterday that the Cyanamid Company was releasing thiocyanate in its effluent and that this was not harmful by itself but would, if mixed with chlorine gas or molecular chlorine, cause the release of cyanide which might be harmful, and it occurred to me that maybe the possibility of the mixture of thiocyanate with just chlorinated water discharged in sewage might not release cyanide as in perhaps Mulatt where there might be chlorinated water discharged from Avalon Beach.

Those were the only points that I noted.

MR. STEIN: Thank you, Mr. Gifford.

MR. REED: Thank you.

I do believe Mr. Tisdale, the member of the Florida Department of Health and Rehabilitative Services would like to be heard.

STATEMENT OF WAYNE E. TISDALE, REGIONAL ENGINEER, FLORIDA DEPARTMENT OF HEALTH AND REHABILITATIVE SERVICES, PENSACOLA, FLORIDA

MR. TISDALE: Mr. Secretary, I thank you for this opportunity to respond. I do apologize for my outburst. I am an emotional person. I have suffered a great deal of numerous things in this area over the past year and a half, and it is rather distressing to me to hear continuous unjust criticisms of our agency, which is new, and the statement that the figure of one million gallons per day, which is entered in the report, being obtained from my office is incorrect.

Now, I don't wish to unveil a lot of anything but I would like to correct this particular point. We did have, at the time this survey was made, some question as to the accuracy of the flow recording equipment at Pensacola's Northeast Plant. That has not been resolved. They have difficulties with it. We are not sure of the degree of accuracy as of the moment, except that some recent work has been done to the equipment to put it in supposedly good operating condition.

As I recall the situation, the Federal survey team collected their data without any flow information. There was even some question at the time as to whether the Northeast Plant would be included in this survey. After the team had left the area and was back in the Athens laboratory, a telephone call was made to me. This matter was discussed, and my recollection of the situation is: Well, we will use one million gallons a day. I suppose that is as good as any.

Now, you may take that for face value. This is all I would like to say, but I want that point made clear, that the erroneous information was not obtained from us as such.

Thank you, sir.

MR. STEIN: Thank you, Mr. Tisdale.

Are there any comments or questions?

MR. REED: We have no other speakers from the State of Florida.

MR. STEIN: If Mr. Tisdale wants to reply, I suspect I speak for the panel, that whenever anyone puts out a figure like a million, you figure it is an estimate. At least that is the way I look it, that something is rounded off.

Does anyone else feel that he wants to make a statement now, because we are at the stage where I think we are going to terminate audience participation in this, and the conferees will convene in Executive Session.

MR. REED: It would be my hope, Mr. Chairman, that there would be a statement in the two-week reporting period from both the L&N Railroad and the Gulf Power Company. I think we can expect a comment in writing and for the record.*

MR. STEIN: I would hope so because those are two companies which were mentioned prominently in the report which did not avail themselves of the opportunity to make a statement here, and it has been my firm conviction that people can speak best for themselves. No one has constituted whether a State, Federal, or local agency can speak for a constituent, and I think we have had pretty good participation here except there has been no statement as far as I know yet from L&N Railroad and Gulf Power.

Are there any further comments?

MR. PATTON: We have one man, Mr. Chairman.

MR. ROSENALL: I wonder if I might present a brief statement.

MR. STEIN: Identify yourself.

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* See pages 542 and 590.

STATEMENT OF JACK C. ROSENAU, SUBDISTRICT CHIEF, U. S. GEOLOGICAL SURVEY, TALLAHASSEE, FLORIDA

MR. ROSENAU: Jack Rosenau, Subdistrict Chief, U. S. Geological Survey.

Mr. Chairman, ladies and gentlemen. I have hung back here because I am not in a position, or I am not here to take a position in this problem or discussions, but I felt that perhaps I should make known the position of the Geological Survey here in this area.

The Water Resources Division of the U. S. Geological Survey has been operating in West Florida since about 1938, in cooperation with the State Division of Geology, the State Department of Transportation, the city of Pensacola and the Counties of Santa Rosa, Escambia, Okaloosa, and Walton.

We monitor some thirteen surface-water gauging stations and thirty or more wells measuring and publishing data collected which includes stream flow, well water levels, chlorides, specific conductance, pH, DO, BOD, coliforms, as well as periodic complete chemical samples.

Our staff includes hydrologists, geologists, engineers, and chemists. Our reports have national and local distribution including water supply papers of the Geological Survey, the State information circulars, reports of investigations, State bulletins, and a series of map reports.

We make investigations of the water resources of the State with funds that originate from interested governmental agencies that are in turn matched by the Federal Government.

We have no regulatory authority, and published and unpublished data are available to anyone.

MR. REED: Thank you very much. We will avail ourselves of that opportunity.

MR. KENNGOTT: May I speak?

MR. REED: Yes, indeed, sir.

Mr. Kenngott.

MR. STEIN: Mr. Kenngott will hopefully conclude the statements from Florida, but we are here, and if anybody has a burning desire to add to the record, the record is open for them.

Mr. Kenngott.

MR. KENNGOTT: I would just like to briefly comment on the statement raised by Dr. Gifford. I wanted to reaffirm our statement yesterday that we are most anxious to cooperate with all of the authorities involved in settling these problems.

After the meeting yesterday, I have arranged with Mr. Wade Knight of the Federal agency to exchange analytical methods with regard to acrylonitrile. We have again expressed our interest and we intend to fully cooperate in the solution of these problems.

MR. REED: Thank you, sir, very much. That is one of the hopes that I have of this conference would be that type of spirit.

Thank you very much.

I think that would probably be a very good place for Florida to end.

(The following letter was submitted for inclusion in the record.)

STATEMENT OF MRS. RAY S. GEIGER,
Route 4, BOX 81, PENSACOLA, FLORIDA

"January 20, 1970

"My dear Mr. Thoman,

"I dislike to talk before such a large audience, but I should like very much to have someone present this -- an old lady's memory of a dear unpolluted Escambia Bay.

Mrs. R. S. Geiger

I think I am a competent witness, for perhaps I am the oldest resident on that bay.

"I am 76 years old, and I have lived beside the bay since I was 10 years old. I married; but General Geiger and I returned to live by this bay because of its lovely sparkling water and wonderful swimming and fishing. I have continued to live here since General Geiger's death.

"I pay taxes on 575 feet of Escambia Bay's beach at a point almost directly opposite American Cyanamid and Escambia Bay Chemical.

"Once my whole family enjoyed the swimming in the dear water with sandy bottom and sandy beaches, where now you would wade in sludge.

"We tonged oysters midway across the channel.

"We caught in half an hour enough speckled trout for a supper on the beach.

"Now there is no clean water to swim in. I cannot let my dog wade in the shallows, for his ankles develop a skin eruption.

"There are no oysters! There are no speckled trout in our area. After one of the 'fish kills' a rookery, near my home, of about 25 egrets, little blue herons, and great blues were wiped out from eating these fish.

"It is rather heart breaking to see the old lovely bay become a death trap.

"I lived by the bay because my children and grandchildren used to love it.

"Now, my taxes for polluted waterside property are over ten times what they were when the bay was something to enjoy!

"I feel I should come to the defense of the old L&N bridge. Before there was so much pollution, there was no need for a wider spacing of its supports. The best fishing used to be there beside the old trestle. Before I was born, my father was one of the civil engineers who surveyed this portion of the L&N Railroad from Pensacola to River Junction.

"I feel a family affection for Escambia Bay.

"I hope you can read this! I am writing on my knee, and listening at the same time to this conference.

"Thank you.

"Sincerely, Eunice Geiger."

MR. STEIN: I don't want to cut anyone else off. Is anyone else here?

Well, I think the conferees have some difficult procedural problems as well as substantive problems to resolve in view of the 15-day extensions requested by several of the participants and granted by the Chair, on how we are going to move with this.

The conferees will go into Executive Session and we will be in this room again at 2:00 o'clock and have an announcement at that time. We will recess our public session until 2:00 o'clock here.

(Executive Session.)

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WEDNESDAY AFTERNOON SESSION

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MR. STEIN: The conference is reopened.

First, I would like to open by a slightly personal note. I want to thank you all for coming and cooperating, because I do think that by your staying with us we have been able to develop a meaningful record and a basis of what I hope will be a productive program.

Also, for lunch today I went out and sampled some of your oysters. I feel so good, and in such a wonderful state of euphoria, I can't be mad at anyone, and that is a bad state of affairs for a regulatory officer.

However, in sampling these delicious oysters, I received from various people maps of the oyster areas which are closed in the State of Florida, and particularly in the Escambia and Pensacola areas.

Now, you very well may know that when oyster beds are closed preventing the shipment of such shellfish into interstate commerce, the Federal Government has direct enforcement jurisdiction. While we did not particularly cover this at the conference, I would suggest that all plans and proposals to clean up the pollution you keep this in mind, because when we get into an area, we intend to clean up all sources of pollution. Just in looking at this map, I think far too many of these oyster areas are closed. They have the potential of being some of the most productive areas in the country. I think, as you people in your area well know, and I know now, you have some of the most delicious oysters available, and we intend to restore this resource to the full use of the people of this area and the people of this country.

I am happy to say that the conclusions and recommendations of the conferees were unanimous, and the conferees representing Florida, Alabama, and the Federal Government are in complete agreement.

The area considered by the conferees is the Conecuh-Escambia River in Alabama and Florida downstream from Brewton, Alabama, and Escambia Bay as well as Mulat-Mulatto Bayou in Florida.

The entire upper section of Escambia Bay north of the Louisville & Nashville Railroad Company bridge is in a state of accelerated eutrophication as shown by unstable dissolved oxygen variations resulting from algal activity; high carbon, nitrogen, and phosphorus concentrations; and oxygen-demanding sludge deposits. Dissolved oxygen at the bottom of nearly half of the bay was less than the 4.0 mg/l criterion established by the State of

Florida for these waters. The closely spaced piling under the Louisville & Nashville Railroad Company bridge adversely inhibits circulation, flushing, and exchange between the upper and lower bay. In Mulat-Mulatto Bayou, dredging and filling for interstate highway construction and residential development, in addition to the above conditions, also contribute to degraded water quality. These conditions are the major causes of the numerous fish kills reported in Escambia Bay and Mulat-Mulatto Bayou during 1969.

The lower section of the bay south of the Louisville & Nashville Railroad Company bridge also has degraded water quality, primarily due to sludge deposits. The only factor preventing an identical condition as that of upper Escambia Bay is the flushing and exchange of pollution out of the area in a relatively short period of time.

These water quality conditions in Escambia Bay and Mulat-Mulatto Bayou are caused by the discharge of carbonaceous, nitrogenous and phosphorus wastes including the following sources in Florida: Escambia Chemical Company, American Cyanamid Company, Monsanto Company, the city of Pensacola Northeast Sewage Treatment Plant; and the Container Corporation of America in Brewton, Alabama.

The major dischargers of carbonaceous wastes are the Monsanto Company, Container Corporation, and American Cyanamid. Escambia Chemical Company, American Cyanamid and Monsanto Company are the principal contributors of nitrogenous waste to Escambia Bay. The Pensacola Northeast Sewage Treatment Plant also discharges significant amounts of nitrogenous material. Monsanto Company and Escambia Chemical discharge most of the phosphorus, although the Northeast Sewage Treatment Plant is also a significant source.

Container Corporation of America and the city of Pensacola Northeast Sewage Treatment Plant reportedly provide about 80 percent removal of their carbonaceous waste at the present time. Furthermore, approximately four-fifths of the residual carbonaceous waste from Container Corporation is stabilized in the Escambia River before reaching Escambia Bay. American Cyanamid has a primary treatment facility. Both Escambia Chemical and Monsanto provide some treatment to their waste effluents.

American Cyanamid Company also discharges acrylonitrile. This compound is toxic to fish.

The heat discharged in the cooling water effluents from the Monsanto Company and Gulf Power Company is such that the temperature of the Escambia River is increased above the recommendations of the National Technical Advisory Committee to the Secretary of the Interior which specify a maximum increase of 4° F. from September through May, and 1.5° F. from June through August. Monsanto's cooling water increased the surface temperature of the Escambia River by 19.5° F. immediately downstream from the outfall. Three hundred yards downstream from the Monsanto outfall, surface water temperatures were 7° F. greater than background. The Gulf Power effluent increased the surface river temperature by 12.25° F.

Benthic fauna in the Escambia River at the Alabama-Florida State line near Century, Florida, showed no significant damage from waste sources above the State line during the FWPCA October 1969 field investigations. However, during extended periods of extreme low flow in the Escambia River near Century, Florida, (1966 and 1968), wastes from upstream sources in Alabama degraded the habitat to a level sufficient to affect the diversity of the biota at the Alabama-Florida State line. Dissolved oxygen levels at the Alabama-Florida State line were above 4.0 mg/l at all times during 1969.

Color in the Escambia River was increased from

70 units at Brewton, Alabama, to about 120 units at Century, Florida. This color increase results from the discharge of treated industrial waste from Container Corporation of America. The official water quality criteria of the States of Florida and Alabama require that no color-producing substances causing deleterious effects be discharged to receiving waters.

Waste discharges to the Escambia River and Escambia Bay in the States of Alabama and Florida cause pollution which endangers the health or welfare of persons in Florida and, therefore, are subject to abatement under the provisions of Section 10 of the Federal Water Pollution Control Act, as amended (33 USC 466 et seq.).

Recommendations:

To reduce or eliminate the accelerated eutrophication of Escambia Bay and Mulat-Mulatto Bayou, and to provide water quality suitable for a wide diversity of desirable uses, the following water quality management and waste abatement program is recommended to be accomplished, except as otherwise specified, by not later than December 31, 1972:

1) There shall be reductions of 94 percent carbonaceous, 94 percent nitrogenous, and 90 percent phorphorus wastes respectively discharged to Escambia River

and Bay from major sources in Florida including American Cyanamid, Escambia Chemical, Monsanto, and the city of Pensacola Northeast Sewage Treatment Plant. Due to the distance from Escambia Bay of Container Corporation of America's plant site, a reduction of 90 percent carbonaceous and phosphorus wastes will be required. The conferees, after evaluation of the material to be presented for the record during the next 15 days following this conference, and after consultation with the parties involved, will recommend allowable waste discharges for each of the major sources. All waste sources shall provide complete removal of settleable solids.

2) An alternative for accomplishing these objectives is the construction of a sewer collection system or systems around the entire bay to intercept wastes from American Cyanamid, Escambia Chemical, Monsanto and Northeast Sewage Treatment Plant as well as future and minor present effluents. This is consistent with the concept of metropolitan planning for waste management. All domestic and industrial wastes could be treated at a central facility with discharge away from Escambia Bay after the recommended carbon, nitrogen, and phosphorus reductions have been accomplished.

3) Color in the Escambia River at the Alabama-

Florida State line as measured at the Highway 4 bridge near Century, Florida, shall be reduced to levels meeting Alabama, Florida, and Federal standards.

4) No further construction dredging shall be permitted in Escambia Bay or Mulat-Mulatto Bayou until a plan for development of the shoreline has been established. At that time, construction dredging shall be permitted only in accordance with this plan, to be completed within one year by representatives of Escambia and Santa Rosa Counties, the city of Pensacola, the State of Florida, the U. S. Army Corps of Engineers, and the U. S. Department of the Interior. Any necessary maintenance dredging in the interim shall be conducted by diking the dredging area. Maintenance of existing channels shall be by hydraulic pipeline dredging only. Disposal of all dredged material shall be to upland spoil sites.

5) The Louisville & Nashville Railroad Company bridge across Escambia Bay shall be rebuilt or modified by not later than January 1, 1973, to eliminate the piling presently adversely affecting the circulation and exchange of water in the bay.

6) The American Cyanamid Company shall immediately cease discharging acrylonitrile.

7) The Monsanto Company and Gulf Power Company,

by not later than January 1, 1973, shall abate the excessive heat being discharged in their respective cooling water effluents.

8) Century, Florida, and East Brewton, Alabama, by not later than December 31, 1972, shall install secondary waste abatement facilities acceptable to their respective State water pollution control agencies.

Do any of the conferees have anything to add?

If not, again, I would like to thank you all for coming, staying, and participating with us.

The conferees will be available individually after the conference to answer any questions.

Mr. Reed.

MR. REED: Mr. Stein, I do have something that I wish to say.

I wish to personally thank you on behalf of the citizens of the State of Florida for coming and chairing this hearing.

I would like to thank Mr. Thoman and his staff for the excellent report.

I would like to thank Mr. Beck and all of the Alabama officials who came most willingly to this table recognizing that their problems were small in Alabama compared to the problems in Florida, but nevertheless looking at this as a river basin problem, and for that we are appreciative.

Appreciation is also extended to the people who came to this room, all of you who came with a spirit to finding a solution to the problems of Escambia River and Bay. I am particularly impressed by the spirit exhibited by the majority of the industrial leaders of this area. From our standpoint, we look forward to working with you and finding a way out of a very difficult situation.

I think the conference has been of extraordinary help, and may in years to come be the keynote of a plan that will have restored the river and the bay to a semblance of its former productivity.

Thank you, Mr. Stein.

MR. STEIN: Thank you.

Now, I am sure if we get the same cooperation from the people in the room who participated in the conference, and those named in the report, that we got from the representatives of Alabama and Florida, and our Federal Regional Office, we will move a long way toward accomplishing the cleanup program that we so earnestly wish to see.

Tomorrow, as you know, we will have another conference in this room on Perdido Bay, and, again, let me indicate that the conferees will be available to you individually after the conference for such discussion as you may wish and will answer any questions hopefully that you may wish to propound.

With that, this conference stands adjourned.

(The conference adjourned at 3:00 p.m.)

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(The following documents were received within the 14-day period following the conclusion of the conference.)

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF COMMERCIAL FISHERIES
FEDERAL OFFICE BUILDING
144 FIRST AVENUE, SOUTH
ST. PETERSBURG, FLORIDA 33701

GULF AND SOUTH
ATLANTIC REGION
(REGION 2)

ADDRESS ONLY
THE REGIONAL DIRECTOR

January 29, 1970

Mr. John Thoman
Regional Director
Federal Water Pollution Control Administration
1421 Peachtree Street NE
Atlanta, Georgia 30309

Dear Mr. Thoman: John:

I request that the attached information on our research activities in Escambia Bay, Florida, be added to the record of the enforcement conference held in Gulf Breeze, Florida, January 20 and 21. It is my understanding that the record will be open for such additions for two weeks. As you know, we did not learn of the meeting in time to prepare a formal presentation for the hearing.

I do appreciate the opportunity you provided for Dr. Nelson of our Gulf Breeze station to participate in the conference on Mobile Bay.

Sincerely,

Dick

R. T. Whiteleather
Regional Director

Attachment

UNITED STATES DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF COMMERCIAL FISHERIES
CENTER FOR ESTUARINE AND MENHADEN RESEARCH
PESTICIDE FIELD STATION
GULF BREEZE, FLORIDA 32561

Information for FWPCA Enforcement Conference

The Bureau of Commercial Fisheries is vitally concerned about pollution of Escambia Bay and contiguous waters and is conducting research on the effects of pollution on commercial fishery organisms from the bay at the BCF Center for Estuarine and Menhaden Research Pesticide Field Station, Gulf Breeze, Florida. These research activities are concerned primarily with pesticides and PCB (polychlorinated biphenyls) that occur in the biota. PCB's are considered industrial pollutants and, unfortunately, are relatively persistent in an aquatic ecosystem. Aroclor® 1254, one of a series of chlorinated biphenyl compounds manufactured by the Monsanto Company, is a light yellow viscous oil with a chlorine content of 54%. It is stable, insoluble in water and highly soluble in lipid. Structurally it resembles chlorinated hydrocarbon insecticides such as DDT.

Investigators at this station analyzed fish and other estuarine organisms, water, and sediments that were collected after local "fish-kills" that occurred during the past year. In addition, other samples were collected from Escambia Bay at periodic intervals and samples of oysters from East Bay have been analyzed at 30-day intervals for the past 2 years. All samples were analyzed for the following pesticides: Heptachlor, BHC, Aldrin, DDT, Dieldrin, Endrin, Methoxychlor, Mirex, Toxaphene, Malathion, and Parathion. Also, analyses for PCB were made. Details of our analytical procedures are available from the station.

In general, we detected only traces ($<$0.010 ppm wet weight body tissues) of DDT and its metabolites in some of the animals involved in the fish-kills and the levels of these pesticides in shellfish from Escambia and East Bay have not exceeded 1 ppm.

We first detected residues of PCB, later identified as Aroclor 1254, in animal tissue in April 1969 at a newly established pesticide monitoring station in Escambia Bay. Subsequent sampling in this area showed residues of the chemical in water, sediment, fish, blue crabs, and shrimp (Table I). We traced one source of Aroclor 1254 to the outfall of Monsanto Chemical Company, approximately seven miles above the mouth of Escambia River, after analyzing 30 water samples from Escambia River and Bay (above and below the outfall). The Aroclor reportedly entered the plant's effluent through accidental leakage of a heat-exchange fluid. High concentrations (290 ppb) of Aroclor in water during the sampling period occurred at the outfall in August and decreased abruptly when leakage from the plant was corrected. Samples taken from the outfall on September 1969 contained only 0.80 ppb. Less than 0.10 ppb of Aroclor was detected in water where Highway 90 crosses Escambia Bay and none of the chemical was detected in the water south of the highway. However, animals now being collected as far south as Santa Rosa Sound contain residues of this chemical.

We are evaluating the effects of pesticides and Aroclor 1254 on estuarine organisms under controlled conditions in the laboratory. Results of preliminary experiments and the levels of residues of these chemicals in the tissues of animals associated with the fish-kills indicate that neither pesticides nor Aroclor 1254 alone caused the mortalities. Since some data are already available on DDT, we are now determining lethal levels of Aroclor 1254 to test organisms and then exposing others to sublethal concentrations for long periods of time.

We have determined that continuous exposure to 5 ppb Aroclor 1254 in the water for 20 days killed 72 percent of a test population of commercial shrimp. A composite sample of the dead shrimp contained 16 ppm Aroclor 1254. Juvenile blue crabs are not as sensitive to the chemical as only one of 20 crabs died during a 20-day exposure to 5.0 ppb. Fish appear to be even less susceptible than crabs.

TABLE I

Residues of Aroclor 1254 in samples from Escambia Bay and River

Sample*	Number of Animals or Organs in Sample	Date Collected (D-M-Y)	Location	Residues of Aroclor 1254 ppm
Fish				
Flounder liver	1	5-6-69	Mulatto Bayou	76.
Flounder muscle	1	"	"	4.5
Flounder gills	1	"	"	19.
Croaker	3	"	"	12.
Menhaden	5	"	"	11.
Pinfish	5	"	"	10.
Menhaden	5	1-7-69	"	12.
Speckled trout gills	1	14-8-69	Pensacola Bay	7.5
Speckled trout liver	1	"	"	21.
Speckled trout	3	31-8-69	Northern Escambia Bay	20.
Flounder liver	1	"	"	184.
Menhaden	6	10-10-69	Mulatto Bayou	5.7
Crustaceans				
Shrimp	10	1-7-69	Mulatto Bayou	1.5
Shrimp	5	31-8-69	Northern Escambia Bay	2.5
Blue crab	6	13-8-69	"	7.0
Blue crab	5	31-8-69	"	6.3
Blue crab	6	9-9-69	Mulatto Bayou	1.0
Sediment				
"		1-7-69	Mulatto Bayou	N.D.**
"		8-7-69	Highway 90	1.7
"		15-8-69	Garcon Point	N.D.
"		"	Mulatto Bayou	N.D.
"		"	Northern Escambia Bay	.14
"		"	Highway 90	1.4
"		"	Outfall 6 miles north of	486.

TABLE I (continued)

[*] Shrimp were collected alive; crab and fish were dead or moribund. Scientific names: trout (*Cynoscion nebulosus*), croaker (*Micropogon undulatus*), menhaden (*Brevoortia patronus*), pinfish (*Lagodon rhomboides*), flounder (*Paralichthys* sp.), shrimp (*Penaeus setiferus*) and (*Penaeus aztecus*), and blue crab (*Callinectes sapidus*).

[**] N.D. = $<$.03 ppm for sediment.

GULF POWER COMPANY
POST OFFICE BOX 1151
PENSACOLA, FLORIDA 32502

R. F. ELLIS, JR.
PRESIDENT

February 4, 1970

Mr. John R. Thoman, Regional Director
U. S. Department of Interior
Federal Water Pollution Control
Administration
1421 Peachtree Street, N.E., Suite 300
Atlanta, Georgia 30309

Dear Mr. Thoman:

Your letter dated January 14, 1970 transmitted a copy of a document entitled "Effects of Pollution on Water Quality, Escambia River and Bay, Florida, January 1970" at the request of Mr. Vincent Patton, Director, Florida Air and Water Pollution Control Department.

Because there was not time between the receipt of your agency's report and the conference held on January 20, 1970 for an adequate appraisal of the contents, Gulf Power Company did not ask to make a statement at the conference.

We have completed our review of the FWPCA report and wish to offer the attached statement for inclusion in the record in accordance with our understanding of the arrangements made during the conference.

Yours very truly,

R. F. Ellis, Jr.

R. F. Ellis, Jr.

RFEjr:jo

Attachment

cc: Messrs. Murray Stein
Nathaniel P. Reed
Vincent D. Patton
Dr. Ira L. Myers

STATEMENT
of
GULF POWER COMPANY
For the Record of the
CONFERENCE ON INTERSTATE AND INTRASTATE POLLUTION OF ESCAMBIA RIVER AND BAY
Pensacola, Florida
January 20, 1970

Under cover letter dated January 14, 1970, Gulf Power Company received from the Regional Director, Southeast Region, Federal Water Pollution Control Administration at the request of Mr. Vincent D. Patton, Director, Florida Air and Water Pollution Control Department, a report entitled "Effects of Pollution On Water Quality, Escambia River and Bay, Florida" and notice that this report would be presented at a conference on interstate and intrastate pollution of Escambia River and Bay beginning January 20, 1970.

Because the time between receipt of this voluminous report and commencement of the conference did not allow adequate time for a responsible appraisal of such a report and its implications, Gulf Power Company did not request time to make a statement during the conference. We now wish to submit our statement for the record.

The allegations of this report, hereinafter referred to as the FWPCA report, pertaining to "thermal pollution" and "excessive heat being discharged" by Gulf Power Company appear to be unfounded in fact. Therefore, no abatement by Gulf Power Company is necessary to conform to the recommendations contained in "Water Quality Criteria," the report of the National Technical Advisory Committee and recognized in the FWPCA report as the best available recommended criteria for safeguarding the quality of water in Escambia River and Bay.

In order to place Gulf Power Company's comments in the proper context, relevant sections of the FWPCA report are repeated herein for reference:

p. 4 "The heated discharge in the cooling water effluents from . . . Gulf Power Company is such that the temperature of the Escambia River is increased above the recommendations of the National Technical Advisory Committee to the Secretary of the Interior which specify a maximum increase of 4°F. from September through May and 1.5°F. from June through August." . . . "The Gulf Power effluent increased the surface temperature by 12.25°F."

p. 8 ". . . and Gulf Power Company, by no later than January 1, 1973, abate the excessive heat being discharged in their respective cooling water effluents."

p. 34 "The Gulf Power effluent increases river temperature from 70.25°F. to 82.5°F. or 12.25°F. over background (Figure 12). This heated effluent clings to the left shoreline in the upper six feet of water and is still evident at Highway 90 bridge (1.0 mile below the effluent ditch) where the upper six feet of water along the right quarter of the river is still

> 7.25°F. above temperatures of the river immediately above Gulf Power Company (Figure 13).
>
> "The effect of these elevated temperatures on biological life in the Escambia River has not been directly ascertained since there are other factors, such as discharge of organic wastes and physical variations in flow and natural sediment load, which could cause deleterious alterations in the biological community. The National Technical Advisory Committee to the Secretary of the Interior has recommended that water temperature in estuaries should not be increased more than 4°F. from September to May nor more than 1.5°F. during June through August (9). On this basis, . . . and Gulf Power Company are discharging thermal pollution to the Escambia River and should abate this pollution."

Though it has not been stated in these terms, it appears that the FWPCA contends that: (1) Gulf Power released heated effluents during October, 1969, which caused maximum local river surface temperature to exceed upstream mean temperature by 12.25°F. and, since this incremental difference in temperature is greater than 4°F., the effluent is regarded as thermal pollution. (2) Excessive heat being discharged is presumed to be that amount of heat which caused the local surface temperature to exceed the upstream mean temperature by more than 4°F. (3) Facilities must be provided by January 1, 1973, to abate this excessive heat.

Gulf Power Company - Statement

The FWPCA report is set forth with the full weight of credibility and authority of the Federal Government, and it has been presented as if it is scientifically defensible as the basis for establishing new regulations to which all users of the Escambia watershed must comply. Gulf Power Company is now and has always been a responsible corporate enterprise, attentive to the requirements of good practice in its field of operations and to the accompanying requirements of safeguarding the public interest. It is obviously sensitive to allegations such as those made or implied in the FWPCA report, and a serious effort has been made to evaluate them.

Referring to the excerpt from p. 4 of the FWPCA report, a question immediately arises. The FWPCA report carefully distinguishes between the Escambia Bay (p. 10-12) and the Escambia River (p. 13-15). The National Technical Advisory Committee also distinguishes between rivers and estuaries in the report entitled "Water Quality Criteria," to which the FWPCA report refers. It is interesting to note that, though the FWPCA report describes the effluent of Gulf Power Company into the Escambia River and makes a careful distinction between Escambia River and Escambia Bay, the report proceeds to reference the recommendations (not the specifications) of the "Water Quality Criteria" for estuaries, not rivers. If FWPCA has redefined the interface between the river and the estuary for some reason, no reference to this action has been found in the report. If not, then the report incorrectly refers to recommendations in "Water Quality Criteria." The appropriate section would be found on p. 42 of "Water Quality Criteria" as follows: "During any month of the year, heat should not be added to a stream in excess of the amount that will raise the temperature of the water (at the expected minimum daily flow for that month) more than 5°F." This recommendation is intended to apply throughout the year and it is based on mixed mean temperatures, not local surface temperatures.

Let us assume for a moment that there may be some possible basis for treating the Escambia River as part of the estuary. If so, then the portion of "Water Quality Criteria" pertaining to estuarine waters would become pertinent. The authors of this publication recognized the difficulty of making quantitative recommendations as emphasized on p. 69 of the text: "It is apparent . . . that data are very sparse on temperature requirements of marine and estaurine species. It is very difficult, therefore, to attempt to suggest temperature requirements for marine and estuarine forms." On p. 69-70, the formal recommendations follow: "Monthly means of the maximum daily temperatures recorded at the site in question and before the addition of any heat of artificial origin should not be raised by more than 4°F. during the fall, winter, and spring (September through May) or by more than 1.5°F. during the summer (June through August)." . . . "Suggested temperatures are to prevail outside established mixing zones . . . ."

These statements quoted from "Water Quality Criteria" evidently form the basis for the statement in the FWPCA report.

The temperature limits contained therein have obviously been used improperly and out of context by FWPCA. First, they are intended to apply to estuaries, not river waters. Second, they are clearly to be predicated on a measurement of mean temperature of the body of water after mixing. The FWPCA report fails to recognize either of these factors.

Now consider the temperature data which are presented in the FWPCA report. Figures 12 and 13 show temperature profiles which are presumably based on temperature measurements, though it is clear that some discretion must have been exercised by the person preparing the figures if the only data are those tabulated in Table 4. Let us also ignore the inconsistencies between the figures and the text in identifying the left bank and right bank, for this is immaterial in the assessment of mean temperature. It is not possible to make an accurate determination of mixed mean temperatures without velocity data, but for simplification the assumption of uniform velocity may be made for the purpose of illustrating a point. Using the profiles of Figures 12 and 13 and assuming uniform velocity over the stream cross-section, the mixed mean temperature would be about 73°F. This is the temperature which would be achieved by the stream at a point downstream where the effluent from Gulf Power Company becomes completely mixed with the Escambia River. This represents a change of less than 3°F. in the river and it would represent a negligible change of mean temperature in upper Escambia Bay.

Pertaining once again to the excerpt from p. 34 of the FWPCA report, "The effect of these elevated temperatures on biological life in the Escambia River has not been directly ascertained . . . ." If no direct connection has been ascertained, it is difficult to understand how FWPCA concluded that Gulf Power Company should invest millions of dollars to build facilities to abate "excessive" heat releases which, are apparently only definable by erroneous application of a key reference, "Water Quality Criteria."

The position of Gulf Power Company is simply this: If the National Technical Advisory Committee recommendations embodied in "Water Quality Criteria" are to be used to develop new criteria for Florida, the applicable sections pertaining to temperature changes in river waters should be properly evaluated and correctly applied to such discharges. If, as FWPCA has implied but not stated, the Escambia River is to be treated as an estuary, and the applicable recommendations of the National Technical Advisory Committee are to be applied, then they should also reflect the intent of the committee recommendations with respect to reasonable mixing. In either case, when the recommendations of the National Technical Advisory Committee are properly interpreted and applied to the effluent of Crist Steam Plant, it is readily apparent that Gulf Power Company is not guilty of "discharging thermal pollution" to the Escambia River, and there is no "excessive" heat which would require abatement by January 1, 1973.

2/4/70

Monsanto

LAW DEPARTMENT

Monsanto Company
350 Fifth Avenue
New York, New York 10001
Phone: (212) 556-5100

February 4, 1970

Mr. John Thomann, Regional Director
South-East Region
U. S. Department of Interior
Federal Water Pollution Control
Administration
Suite 3000
1421 Peachtree Street N.W.
Atlanta, Georgia 30309

Re: Federal-State Water Pollution Conference
Pensacola (Gulf Breeze), Florida

Dear Sir:

Forwarded herewith is the Statement of Monsanto Company to the subject Conference, which is submitted within the time granted for the record of that Conference to remain open.

We trust that the comments offered will contribute to your understanding of the problems faced in preserving the water quality of Escambia Bay.

Should you have any questions with respect to the material offered in the Statement, please do not hesitate to contact me.

Very truly yours,

REOLeary

Richard E. O'Leary
Sr. Attorney

REO/bm
Enclosure
SPECIAL DELIVERY/REGISTERED MAIL

MONSANTO COMPANY
STATEMENT
to
FEDERAL-STATE WATER POLLUTION CONFERENCE
PENSACOLA (GULF BREEZE), FLORIDA

Summary

Monsanto Company, (Monsanto), a party affected by the Report of the Federal Water Pollution Control Administration (FWPCA) (dtd. January 1970), the public Conference conducted January 20-21, 1970, and Conclusions and Recommendations of the Conferees published January 22, 1970, submits this statement to the Conference within the period during which the Record of the Conference is to remain open by direction of the Chairman in response to Monsanto's formal oral presentation of January 20, 1970, a copy of which is attached and made a part hereof.

Monsanto is pleased to note that both the Report and Conference record during the two-day session confirm our own understanding that the Pensacola Nylon Plant of Monsanto, (Plant), fully complies with all federal and state statutes and regulations relevant to the Plant's impact on the water quality of the Escambia River and Bay.

Full compliance with the regulatory scheme governing the maintenance of the water quality of Escambia Bay aside, Monsanto shares the public interest in maintaining the two statutorily established beneficial uses of those waters which affect the Plant's vital interest; i.e., "industrial," for the production of man-made fibers, and "recreational," for the health and welfare of the families of some 6,000 employees necessary to that production.

We are satisfied that the mounting weight of recent evidence suggests that there may be a need for the State of Florida to establish numerical threshold criteria for phosphates and nitrate Wastes contributed by Sources to Escambia Bay without regard to an absolute demonstration of cause and effect with respect to the quality of those waters. Monsanto has previously committed to a cooperative effort with the State of Florida to explore and evaluate such standards and, here, reconfirms that determination.

Monsanto respectfully demurs, however, to certain of the data (and conclusions drawn therefrom) contained in the Report and the general Conclusions and Recommendations of the Conference. The principal points which Monsanto addresses with significant reservation are set forth below.

Part I.

Conclusions and Recommendations

Federal-State Conference[1]

The Conference Conclusions, insofar as they appear to be based on the data and conclusions of the Report, would be equally subject to the comments on the Report offered below. The Recommendations are, however, deserving of certain additional comment with respect to their application to the Plant.

1. 94% Reduction Carbonaceous. Florida regulations[2], as approved by the Secretary of the Interior[3], require 90% removal by not later than January 1, 1973. The Plant presently removes 97% of such Wastes and thus meets both the requirements of Florida and the recommendation of the Conference.

2. 94% Reduction Nitrogenous/90% Reduction Phosphorous. Florida regulations, as approved by the Secretary of the Interior[4], provide no standards for these materials, thus the contribution of such Wastes by the Plant (which are substantially less than the total produced) do not offend the requirements of Florida or constitute Pollution[5]. Monsanto has committed its resources to the FA&WPCB to support its efforts to establish numerical threshold criteria which would be prescribed for all Sources of these Wastes contributing to the Bay. Once the standard desired for these Wastes in the Bay has been established, such criteria would offer the most effective means for achieving the objectives sought, and would be consistent with the approach required by the relevant statutes and regulations.

3. Abate Excessive Heat in Cooling Water Effluents. Florida regulations[6], as approved by the Secretary of the Interior[7], state that temperature shall not cause any damage to aquatic life or vegetation. The Report finds none, thus the Plant effluent temperature does not offend the requirements of Florida or constitute Pollution. Monsanto considers that a better understanding of the effects of temperature is required, but will consult with the FA&WPCB on the appropriate parameters of the mixing zone and the manner of intermixture to be achieved within such a zone.

The Conference proceedings, its Conclusions and Recommendations and the Report constitute a valuable contribution to an understanding of the problems faced in preserving the water quality necessary to support the beneficial uses prescribed for Escambia Bay. That critical analysis may suggest the need for additional sharpening of the work product of the Conference demonstrates the extreme difficulties faced by any responsible body in synthesizing such a complex problem in a period of seven days. The State of Florida is indeed fortunate to have a Board of Air and Water Pollution Control that is motivated and equipped to go forward in cooperation with the Federal Water Pollution Control Administration and persons affected to successfully consummate the efforts set in motion by Governor Kirk during 1969. Monsanto fully supports these efforts and dedicates its technical skills and economic capacity to achieving an ultimate disposition of the problem which is in the public interest.

Footnotes

Part I.

1. Published by Chairman Stein on January 22, 1970.

2. Ch.28-5.04, Rules of the FA&WPCB, Pollution of Waters.

3. U.S. Dept. of the Interior, ltr. to Governor Kitk, (dtd. 1/17/69).

4. FNs. 2&3, supra.

5. Fla. Stat. §403.031(3).

6. Ch.26-5.05(2)(g), Rules FA&WPCB, Pollution of Waters.

7. U.S. Dept. of Interior ltr. to Governor Kirk dtd. 1/17/69. Note, the Dept. requested the ultimate establishment of numerical temperature criteria but recognizes the unique water temperature problems of Florida.

Part II.

FWPCA REPORT[1]

The Report, which served as the predicate for the Conference, (and from which the Conference apparently drew its Conclusions and Recommendations published on January 22, 1970), offers a compilation of interesting and valuable data. When taken together with the work of the Florida Air and Water Pollution Control Board, the Escambia-Santa Rosa Water Pollution Task Force and the recent studies of Tisdale[2] and Hopkins[3], persons concerned with preserving the beneficial uses prescribed for Escambia Bay[4] are presented with an imposing body of evidence suggesting that the water quality of the Bay is deteriorating. There would appear to be little dispute that there is a need to refine the objective standard against which to measure the water quality of the Bay. Once such standards are defined, the task of establishing minimum threshold criteria[5] for all Sources[6] of Waste[7] flowing into the Area[8] can be reduced to manageable proportions.

Without detracting from the value of the Report's contribution towards the study of the problem under consideration, and acknowledging the superficial nature of a ten day review of a Report that features 27 days of data collection and two and one half months of evaluation and preparation prior to publication on January 15, 1970, a number of questions should be raised with respect to the data and conclusions drawn therefrom. The following comments are generally limited to those matters affecting the Plant, and no priority is intended to be reflected in the order of presentation.

1. A number of key terms or qualifying phrases are used throughout the Report without benefit of adequate definition and/or indication of the relevance to the attainment of an objective water quality goal to be addressed with respect to the Bay.

a. "Accelerated Eutrophication." The Report offers no standard definition for the eutrophic state which would normally be expected or projected for Escambia Bay which, in turn, would permit an evaluation of the degree to which that state had been accelerated.

b. "Fish Kills." The Report refers to such events often and as "documented," but fails to quantify or qualify the events in a manner which would permit an evaluation of the magnitude of the problem. There are no data on, e.g., number of fish involved in such events under "normal" conditions or the several possible "causes" of such events beyond the totality of "causes" generally cited in the Report as the "major causes."

c. "Population Equivalent." The Report consigns the Waste materials values in pounds per capita, per day, that may well be valid if referring to a broad geographic basis (such as the United States), but are not particularly instructive in addressing the problem at issue. In the absence of a total "population equivalent" assimilative capacity value for the Bay, it is virtually impossible to evaluate either the impact of existing figures offered for the Wastes, or those that would result from implementation of the Report's Recommendations.

d. "Major," "Principal," "Most," "Excessive." These are qualifiers often used in the Report without adequate reference to a standard or an indication that they are relevant only in comparing the data of the five Sources compared as contrasted with all Sources contributing Wastes to the Bay.

2. The data offered covers but two (2) months of 1969 and no comprehensive historical comparisons are offered which would permit determination of seasonal or yearly averages of the subject levels, and deviations therefrom.

3. The data offered on contributions of carbonaceous, nitrogenous and phosphorous Wastes is limited to five (5) Sources and the data from these individual five Sources is then compared only against the sum of the five to obtain the substantial percentages cited.

4. The total discharge of all such Wastes from all Sources (e.g. nature, agriculture, municipal and industrial) is not presented in the Report.

5. There are no data on the levels of such Wastes in the Bay which must be maintained or achieved to preserve the beneficial uses established for the Bay and against which the effectiveness of corrective action could be measured.

6. There are no data offered on the numbers of fish present in the Bay or River, and/or data on the trends of such fish populations.[9]

7. The Report suggests a decline in the "recreational use" of the Bay, but offers no data in support of the proposition. The Conclusions of the Report fail to designate which uses, if any, prescribed for the Bay are being denied or demonstrably threatened by the conditions cited.

8. The Report concludes that a totality of the conditions cited are the "major causes" of the "numerous fish kills" reported during 1969 (at page 2), but with respect to the only "major fish kill" into which FWPCA apparently made a direct investigation, no more definitive conclusion than that "the reduced dissolved oxygen and/or toxic material was responsible," was possible (page 18). The obvious difficulties in establishing the causal relationships of the several factors involved should be clearly set forth in the Report.[10]

9. The Report offers no data on River levels of carbonaceous, nitrogenous and phosphorous material above the Plant that would permit an evaluation of the Plant's percentage contribution to the total levels below the Plant. (e.g., the Plant's own data suggests that the 5 Sources referenced contribute but 7% of the total carbonaceous material in the River below the Plant, based on the data

presented in Table 2, following page 23 of the Report.

10. It would appear probable that the Report reflects a serious error in logic leading to its conclusions that reduction of pollutants by industry will save the Bay. Some simple calculations indicate that if all industry shut down, the TOC in the Bay would remain above 3.0 mg/l.

Example: From Table 2, p. 23 -- Summary of Waste Discharges, carbonaceous Material.

Source	Total Organic Carbon, Lbs/Day
Container Corp.	2,050*
American Cyanamid	5,230
Escambia	194
Monsanto	3,900
Pensacola	129
	11,503 Lbs/Day T.O.C.

*Actual contribution 10,410 Lbs/Day; multiplied by correction factor from p. 6.

River flow, 1969 average was 3,000 CFS, or 16,200$\overline{M}$ Lbs/Day

Converted to Concentration, ppm = $\frac{11,503}{16,200\overline{M}}$

Industrial Contribution to Escambia Bay = 0.71 mg/l
Actual T.O.C. of Bay, as reported = 4.0 mg/l

For the purpose of setting a lower standard for industry, if we accept the Report's approach to the problem, a 10 year average river flow would be realistic, since the primary concern is long-term eutrophication. Annual average river flows are reported on Fig. 4, p. 13 of the Report. For the 10 year period, 1959 - 1968 inclusive, the 10-year average river flow is 5,818 CFS.

Calculation of allowable T.O.C. by industry:

5,818 MCFS x 5.400 = 31,900$\overline{M}$ lbs/day river flow

Industrial Input = 0.26 ppm x 31,900 - 8,300 lbs/day T.O.C.

Reduction required for all contributors:

$$\frac{11,503 - 8,300}{11,503} = 28\% \text{ reduction}$$

It appears, from the numbers in the Report, that the 94% reduction was calculated based on the assumption that all the 4.0 mg/l T.O.C. in the Bay came from industry, and to bring the industrial contribution to the recommended 0.26 mg/l would mean the following:

$$\frac{4.0 \text{ mg/l} - 0.26 \text{ mg/l}}{4.0 \text{ mg/l}} = 94\% \text{ reduction}$$

If this is true, the calculation is incorrect. Thus, the Bay might continue to eutrophy without remedy.

11. Again accepting the Report's methodology, similar computations can be made putting into question the validity of the manner in which standards were reached for nitrogen and phosphates. The standard acceptable for nitrate-nitrogen is set at 0.03 mg/l, (perhaps a bit pristine and unrealistic, especially in an agrarian environment). For comparison the Report adds together Nitrate Nitrogen plus Ammonia Nitrogen and computes:

$$\text{Reduction} = \frac{0.49 \text{ mg/l} - 0.03}{0.49} = 94\% \text{ reduction}$$

For reasons similar to those cited above, this computation appears to be incorrect. First, the Report assumes all the nitrogens in the Bay come from industry. Second, if the Report uses a nitrates standard, it should compare the nitrates average in the Bay. From the data in Table 5 on p. 39 this can be computed to be 0.10 mg/l nitrates-nitrites nitrogen in the Bay, instead of the 0.49.

12. The Report, at page 4, states that the Plant provides "no treatment" to the Waste effluents. This statement was modified in the Conference Conclusions to "some treatment." The Plant presently removes 97% of the 260,000 pound BOD load generated per day. "Treatment" and "removal" are synonymous terms, addressing the same objective - the limitation of Wastes to be intermixed with the receiving waters by a Source.[11]

13. The percentage reductions of nitrogenous and phosphorous Wastes from the Plant, as suggested in Section VII, Abatement, of the Report, bear no relationship to an objective

standard level for these materials in the Bay. The ultimate pounds per day suggested as maximums are open to serious question as to technical feasibility - without regard to the economics involved. A standard which would require industry to eliminate, in the technical sense, all Wastes, denies industry the beneficial use of the waters in question.

14. The Report concedes the lack of any demonstration of the causal relationship of the Plant effluent's thermal characteristics to harmful effects on aquatic life in the Bay. In addition, there is a total absense of data that would indicate that the Plant's effluent has any influence on the temperature of the waters of the Bay.

The river temperature recovers almost completely to normal within a half mile of the Plant discharge. Here again a calculated thermal increase would show numbers which contradict conclusions drawn from the Report.

Outfall Flow, $50\overline{M}$ gpd = $375\overline{M}$ lbs/day Δ Temp. = 20° F

River Flow, 1,350 CFS - $7{,}300\overline{M}$ lbs/day

Heat Balance, assuming only one-half the river flow goes past Plant

$$\Delta \text{ Temp. River} = \frac{375\overline{M} \times 20}{\frac{7{,}300}{2} + 375} = 1.8^{\circ}\text{F Rise}$$

Measurements showing greater rises than this are probably a matter of inadequate time allowed for mixing.

15. The Report refers to recommendations of "The National Technical Advisory Committee" to the Secretary of the Interior, but fails to focus on the fact that the recommended temperature increase limitations apply to estuaries. As indicated above, the temperature rise attributable to the Plant effluent is fully dissipated within a reasonable mixing zone below the Plant, and well before the water enters the Bay.

16. The Report reference, at pages 43 and 46, to the effect of physical alterations in and around the Bay in recent years, which, taken together with the very active Waste abatement program implemented in the Bay area by the State of Florida, during the same period, strongly suggests that the state of eutrophication found, and the levels of Waste materials measured, may be wholly attributable to the deliterious interference with the natural

flushing of the upper Bay. If so, the most direct and effective approach to altering the current conditions in the Bay might be to reestablish an effective flushing pattern.

17. The Report recommendation of a Waste interceptor system to be constructed around the entire Bay, with Waste removal to be achieved by a central facility, is deserving of consideration along with any other innovative approach to the problem of maintaining water quality. However, serious consideration of the proposal must await cost studies (land acquisition alone would likely feature a substantial investment), technical feasability studies (some Wastes may be suceptible to no presently known removal method), and estimates on time to accomplish the objectives established in terms of the water quality criteria established for the Bay.

Footnotes

Part II.

1. Effects of Pollution on Water Quality, Escambia River and Bay, Florida, U. S. Department of the Interior, Federal Water Pollution Control Administration, Southeast Water Laboratory Technical Services Program, Athens, Georgia, (January 1970), referred to in this Statement as the "Report."

2. "Report of Investigations into Pollution of Pensacola Waters," W. E. Tisdale, P. E. (May 19, 1969).

3. The Escambia River and Escambia Bay during Summer, 1969: A Report in Two Parts, Dr. T. Hopkins, (December, 1969).

4. Fla. Stat. § 403.021(2) reads in part,

> "[T]he public policy of this State [is] to conserve the waters . . . for . . . fish and other aquatic life . . . industrial, recreational, and other beneficial uses . . ."

This provision carries forward the prescriptions of 33 U. S. 466 g. (c) (3) which provides that,

> "[T]he State . . . shall take into consideration [the waters] use . . . for . . . propogation of fish . . ., recreational purposes, . . . industrial, and other legitimate uses."

5. Chapter 28 - 5.04(3), Rules of the Florida Air and Water Pollution Control Board, Pollution of Waters.

6. Fla. Stat. § 403.031 (6).

7. Fla. Stat. § 403.031 (11).

8. Fla. Stat. § 403.061 (13).

9. Note is taken of pages 21 - 22 of the Report: (i) the fish population data incorporated by reference extends only to 1967, but (ii) the recent trend comments, i.e., "number of reported kills in the river has declined" and "appears to be an increase in fisherman success in the past year" would suggest an improving situation in the River, contra to the overall thrust of the findings of the Report.

10. Ref. the colloquy of Messrs. Patton (Florida A&WPC Dept.) and Trina (FWPCA) on January 20, 1970. Mr. Patton: "If we had a

Footnotes

magic wand and cut off all artificial sources of BOD, carbonaceous, nitrogenous, and phosphatic material, in your opinion, would this mean there would be no more fish kills in Escambia Bay for some period of time?" Mr. Trina: "I think that is too simple an answer . . . . [I]t's taken a long time to develop - it is obviously going to take a while to rectify itself."

11. Ch. 28 - 5.04 (1), Rules of the FA&WPCB, Pollution of Waters. See also Ch. 28 - 5.13 et. seq. specifically providing for Drainage Wells. The Plant operates such a well pursuant to State of Florida Permit 17 - 4 - 63 and letter of V. D. Patton, dtd. January 31, 1963. Other pertinent material includes: Plant application, ltr. of 8/24/62, based on conferences with U. S. Geological Survey; Fla. Geological Survey, ltr. of 9/11/62, citing review with U. S. Geological Survey; "Waste Injection into a Deep Limestone in Northwestern Florida," J. T. Barraclough, Geologist, approved for publication by U. S. Geological Survey; "Deep Well disposal of Nylon Waste Water," Batz, 60 Chem. Eng. Progress, No. 10 at pg. 85; Dept. of Investigations No. 29, "Aquifers and Quality of Ground Water Along the Gulf Coast of Western Florida," Barraclough and Marsh, for the U. S. Geological Survey in cooperation Fla. Geol. Survey (1962).

Part III.

Federal Interest in Florida State Waters

Following Monsanto's oral presentation at the Conference on January 20, 1970, the Chairman posed a series of questions and comments designed to clarify the interest of the United States in the quality of the waters of the State of Florida. A summary statement on this point, therefore, is appropriate.

There is but one reasonable Constitutional basis for the Federal Water Pollution Control Act, (Act), and that rests in the power to regulate interstate commerce[1]. However broadly this power may be construed, there is no support for the proposition that the United States may regulate the beneficial uses of Florida state waters on grounds looking solely to the public health and welfare, as those conditions may be evaluated by the United States. A fair construction of the references to "health and welfare" in the enabling legislation[2] must, therefore, be that the administrative agency concerned, (Department of the Interior), carries a dual task in the discharge of its responsibilities under the Act; first, a finding of an impact on interstate commerce and in addition, that the matter causing or contributing to pollution endangers the health and welfare of any persons[3]. The Constitutional vitality of § 466g.(c). of the Act, directing that each State establish water quality criteria and a plan for the implementation and enforcement, thereof, is questionable at best[4] but has been mooted in the case of the State of Florida. Florida has enacted legislation[5] implemented by appropriate administrative regulations[6], and the Secretary of the Interior has determined[7] that the water quality criteria and plans so established are consistent with the Congressional dictates that public health and welfare be protected and water quality enhanced while taking into consideration the uses of the waters, (e.g., recreational and industrial).[8] It is, therefore, to the Florida Statutes and Administrative Regulations to which Sources[9] of Wastes[10] (such as the Plant) must look to determine the numerical threshold criteria for Waste materials that may be intermixed with the receiving waters of the State of Florida without constituting Pollution[11] of those waters.

The federal interest pursuant to § 466g.(c). of the Act, having been implemented by the events recited above, the predicate for the instant Conference must therefore be found in § 466g.(d) (1) of the Act. Again, the basic Constitutional questions that could be raised are mooted, as the Conference was conducted at the invitation of the State of Florida[12]. The charter set forth by Governor Kirk appears to fall within the enabling language of § 466g.(d) (1) of the Act[13].

The Act fails to advise as to the end product to be anticipated from the Conferees under the instant circumstances. § 466g.(d) (4) does offer some guidance, however, in enumerating the matters of which the Secretary of the Interior may take note in his summary of the Conference discussions[14]. Thus the role of the "federal interest" is readily discernible and would appear to fall comfortably within a well balance scheme of federal-state regulation.

Footnotes

Part III.

1. U. S. Constitution, Art. 1 § 8 cl.3.

2. 33 U. S. 466g ; *et. seq.*

3. 33 U. S. 466g.(a).

4. See, generally, the discussion by Bermingham January '68 Bus. Law 467.

5. Fla. Stat. § 403 *et. seq.*

6. Ch. 28-5, Rules of the Florida Air and Water Pollution Control Board, (FA&WPCB), Pollution of Waters.

7. U. S. Dept. of the Interior ltr. to Gov. Claude R. Kirk, Jr., (dtd. 1/17/69).

8. 33 U. S. 466a.(a) and g. (c) (3).

9. Fla. Stat. § 403.031 (11).

10. Fla. Stat. § 403.031 (6).

11. Fla. Stat. § 403.031 (3).

12. FWPCA, Report, pg. 1 citing Governor Kirk's request for "technical assistance in evaluating . . . waste sources . . . entering Escambia Bay . . ."

13. "Whenever requested by the Governor . . . the Secretary . . . if such request refers to pollution . . . endangering . . . persons in a state other than that in which the discharge . . . originates . . . shall call promptly a conference . . ."

14. "[T]he Secretary shall prepare . . . a summary of conference discussions including (A) occurrence of pollution of interstate or navigable waters subject to abatement [under the Act]; (B) adequacy of measures taken toward abatement of the pollution; and (C) nature of delays, if any, being encountered in abating the pollution."

Part IV.

Administrative Due Process

The status of the "Conferences" provided for in §466g.(d) (1) have not been explored insofar as our research reveals, by interpretive cases. The provisions of §466g.(d) (3), however, suggest that a "person . . . affected" must consider that he may be dealing with a Conference that is a potential first step in the exercise of administrative remedies. As stated in Monsanto's presentation of January 20[1], Monsanto received the Report[2] on January 15, 1970. The Report so received reflected that Monsanto was a person "affected" and thus afforded a right to make a "full statement" of its views to the Conference[3]. The public sessions of the Conference on January 20-21, reflected that the data, conclusions and recommendations of the Report were the only relevant materials considered in a significant way by the Conferees. Thus, the failure to grant the three weeks' prior notice[4] materially detracted from the opportunity of persons affected to make full statements. The Chairman of the Conference, having previously taken note of certain difficulties encountered in printing the Report, granted Monsanto's request to keep the Conference Record open for an additional fifteen (15) days following the Conference[5]. In light of the foregoing, the decision of the Conference to publish "Conclusions and Recommendations"[6] two days later would appear to be open to serious question. Apparently the only matters left open for consideration by the Conferees with respect to additional material to be presented for the record during the 15 day period is the "recommended allowable waste discharges for each of the major sources."[7]

Such a limited reception by the Conference of material from sources other than the Federal Water Pollution and Control Administration may well fall short of the standards normally associated with administrative procedures.

Footnotes

Part IV.

1. See Attachment.
2. Effects of Pollution on Water Quality, Escambia River and Bay, Florida, U.S. Dept. of Interior, Fed. Water Pollution Control Administration,(dtd. January 1970).
3. 33 U.S. 466 g.(d) (3).
4. Ibid.
5. Conclusions and Recommendations of the Federal-State Enforcement Conference on Pollution of Escambia River and Bay, Florida - Alabama, published January 22, 1970.
6. Ibid.
7. Fn. 5, supra., Part B., Recommendations, pgs. 4-5.

Statement Made By

WALTER T. CLINE, PLANT MANAGER

MONSANTO COMPANY'S PENSACOLA PLANT

AT

FEDERAL-STATE WATER POLLUTION CONFERENCE

Pensacola, Florida

January 20, 1970

Gentlemen, I am Walter T. Cline, plant manager of Monsanto Company's nylon plant at Pensacola, Florida. We appreciate the opportunity to appear before you and make a statement of our position relative to the information and recommendations presented at this conference.

We recognize that water quality is one of the major environmental problems faced by the Escambia Bay area today. Our plant, along with all other sources of waste, has a vital stake in the search for improved environmental quality.

The efforts of Monsanto-Pensacola to protect the water quality in this area began even before we started construction on the plant in 1951. These efforts have included research to determine the possible effects of plant wastes, and the collection of technical information and background data on the Escambia River. Throughout the years these data have been made available on a cooperative basis to appropriate federal, state and local agencies for the benefit of everyone in our area.

During the 17-year history of plant operations, Monsanto invested in excess of $8 million in pollution abatement. The first part of this sizable investment was spent on construction of retention ponds which segregated process wastes. These ponds enabled the plant to comply with all existing water quality regulations, and the State of Florida granted us a permit for their operation.

(MORE)

Since 1957, we have invested $3 million to remove organic materials from the plant wastes. The first $2 million was spent on secondary biological treatment to achieve an 80 per cent reduction. Operation of these treatment facilities cost one-half million dollars per year. Because of extreme difficulties encountered in treating our process wastes, an additional $1 million investment was required for process treatment modifications to achieve a 90 per cent treatment level.

Today, we remove 97 per cent of the BOD (biochemical oxygen demand) load generated at our plant. This 97 per cent reduction represents a removal of 260,000 pounds a day from our effluent before it is discharged to the river.

The Escambia River and Upper Escambia Bay area is classified as "Class III Water" by the Florida Department of Air and Water Pollution Control. The Monsanto-Pensacola plant has through the years, and presently, meets all standards established by the State of Florida for Class III waters.

Over and above these requirements, we have worked since last July on a cooperative basis with the Florida Department of Air and Water Pollution Control on the question of nitrate and phosphate levels in Escambia Bay. We are pleased to announce today that process changes have been implemented during the past two months which are substantially reducing our nitrate and phosphate discharges to the river.

I assure you that the Monsanto-Pensacola plant is fully aware of its responsibilities as a corporate citizen in this community. We have fulfilled these responsibilities in the past and have willingly complied with all state pollution regulations and we intend to continue to do so in the future. We appreciate the opportunity to present our comments to you, as we have appreciated working with the Florida Department of Air and Water Pollution Control in its efforts to safeguard the water quality of our state.

(MORE)

Mr. Chairman, as you are aware, Monsanto received the federal report for this conference on January 15, 1970. Should further study indicate a need, we respectfully request the opportunity to submit additional written comments for the record within the next ~~30~~ 15 days.

Thank you.

-0-

UNITED STATES
DEPARTMENT OF THE INTERIOR
FEDERAL WATER POLLUTION CONTROL ADMINISTRATION
WASHINGTON, D.C. 20242

FEB 27 1970

Mr. G. J. Kenngott
Manager, Santa Rosa Plant
American Cyanamid Company
Wayne, New Jersey 07470

Dear Mr. Kenngott:

Thank you for your recent letter forwarding the supplemental statement of the American Cyanamid Company for the record of the conference on pollution of the waters of the Escambia River Basin, held January 20-21, 1970.

This statement will be made a part of the conference record.

Sincerely yours,

/sgd/ Murray Stein

Murray Stein
Conference Chairman

AMERICAN CYANAMID COMPANY
WAYNE, NEW JERSEY 07470

February 5, 1970

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. Murray Stein
Assistant Commissioner
Office of Enforcement
U. S. Department of Interior
Federal Water Pollution Control Administration
Washington, D. C. 20242

Dear Mr. Stein:

Re: Federal-State Enforcement Conference on Pollution of Escambia River and Bay, Florida-Alabama

Enclosed find American Cyanamid Company's supplemental statement in connection with the above-reference conference.

Yours very truly,

AMERICAN CYANAMID COMPANY

By GJKenngott
G. J. Kenngott
Manager, Santa Rosa Plant

GJK/PTS:fae
Enc.

CC: Mr. Vincent D. Patton (2)
Mr. John R. Thoman (1)
Dr. I. L. Myers (1)

FEDERAL-STATE ENFORCEMENT CONFERENCE ON POLLUTION OF ESCAMBIA RIVER AND BAY, FLORIDA-ALABAMA

Supplemental American Cyanamid Company Statement for the Record

The formal report issued by the Federal Water Pollution Control Administration entitled "Effects of Pollution on Water Quality, Escambia River and Bay, Florida" - January, 1970 (hereinafter called "report" and "Federal report") at the beginning of the Conference recommended that, "The American Cyanamid Company immediately reduce acrylonitrile concentrations in its waste effluent below 10% of the levels demonstrated to be toxic to fish." (page 8). The toxic level of acrylonitrile was stated as being 30 mg/l (page 32). In the conclusions and recommendations issued at the end of the Conference the conferees disregarded the formal report of the FWPCA and the scientific facts regarding toxicity of acrylonitrile and stated, "The American Cyanamid Company shall immediately cease discharging acrylonitrile." (Recommendation 6, Page 6).

We feel both recommendations are unwarranted because they are based on extremely limited data and make no allowance for reasonable mixing and dilution in the receiving waters.

ACRYLONITRILE

TOXICITY

The toxicity level of acrylonitrile is well documented. The Water Quality Criteria, California State Water Quality Control Board, referenced in the Federal report, states that the toxic boundary of acrylonitrile is 30 mg/l. Further, a research report from the Environmental Sanitary Engineering Laboratories of Washington University, St. Louis, entitled "Behavior of Organic Chemicals in the Aquatic Environment" and published in the summer of 1966 by the Manufacturing Chemists Association states on Page 52 that 100% survival of bluegills was found at 10 mg/l of acrylonitrile. The reported TL_M was 100 mg/l.

A number of investigators have demonstrated that fish will tolerate relatively high continuing concentrations of acrylonitrile nitrogen far in excess of that found in Escambia Bay water at Cyanamid's outfall. This is supported by the following references:

1. Dr. C. E. Renn reported in Sewage and Industrial Wastes, Vol. 27, No. 3, March, 1955.

2. H. J. Bandt, in Zeitschrift fur fisheri, Vol. 2, pp. 457-461, 1953.

3. Cherry, A. B., Gabaccia, A. J. and Senn, H. W. in Sewage and Industrial Wastes, Vol. 28, No. 9, 1956.

4. Brieger, Rieders and Hodes reported in AMA Arch. Industrial Hygiene and Occupational Med. 6, 128, 1952.

ANALYTICAL RESULTS

The report states, "The American Cyanamid effluent sample contained acrylonitrile at a concentration of about 100 mg/l", (page 32). This figure, as admitted by Federal researchers, is the result of one analysis on one grab sample of our effluent.

Table 1, in contrast, shows the results of numerous acrylonitrile analyses on samples taken from our effluent line, on samples of Escambia Bay water in the immediate vicinity of our outfall, and on samples of Escambia Bay water taken at a distance of 300 ft. from our outfall.

The levels found in the effluent are substantially lower than the 100 mg/l concentration cited in the FWPCA report. The range of acrylonitrile concentrations in the effluent was 2-37 mg/l for sixteen samples taken between Jan. 17, 1970 and Jan. 30, 1970. This indicates that the acrylonitrile concentration reported by the FWPCA is not representative of Cyanamid's effluent stream.

We further submit, according to the results in Table 1, that a dilution greater than 100:1 occurs virtually immediately upon discharge of our effluent in the Bay. The observed concentration of acrylonitrile in the Bay at our outfall, therefore, is far below any concentrations reported harmful to fish.

ANALYTICAL TEST PROCEDURES

The Analytical Laboratory at American Cyanamid Company's Fortier Plant near New Orleans, Louisiana, has considerable expertise and experience in the analysis of acrylonitrile. Fortier's Instrumental Analysis Group positively confirmed the accuracy of the Santa Rosa Plant's acrylonitrile test procedure using a Perkin Elmer, Model 270, Gas Chromatograph - Mass Spectrometer. Confirmation was received for applications of test procedures to acrylonitrile both in our effluent and in Escambia Bay water.

A copy of Cyanamid's analytical procedure is attached. In a phone conversation on January 30 between Mr. Wade Knight, FWPCA, Athens, Georgia, and Mr. E. D. Williams, American Cyanamid, it was concluded the procedures used at both locations are essentially equivalent.

BIOASSAY RESULTS

Fish bioassays were conducted in Cyanamid's Santa Rosa Laboratories using standard methods and fish species obtained locally. Table 2 shows 100% survival of fish for greater than 72 hours in an environment containing 75% undiluted effluent and 25% bay water. One test was continued for a total of 900 hours with 100% survival.

It is significant that one such test was conducted on a composite effluent sample taken on the same day that FWPCA representatives collected a grab sample for analysis of acrylonitrile.

We hold the results of these tests to be prima facie evidence of non-toxicity of our normal waste discharges.

WASTE DISPERSION

The Federal report stated that Cyanamid discharges its effluent into the Bay by means of a 1200 ft. submerged outfall. Actually, Cyanamid's outfall line is 5000 ft. long; its location is shown on copies of Figures 14 and 15 of the Federal report, which are attached.

The design and operation of this outfall were based on a 1957 survey which determined the Bay's circulatory patterns and assimilative capacity, and took into account the ebbtide and flood tide currents. This work was reported by L. L. Hedgepeth, A. J. Gabaccia, C. G. Mauriello, and H. W. Senn, Sewage and Industrial Wastes, Vol. 30, No. 1, Jan., 1958, pp. 46-56.

The outfall is located 9500 ft. from Floridatown, 2400 ft. off Fisherman's Point and 7400 ft. from the entrance of Mulatto Bayou. In view of the location of our outfall and the tidal flow patterns shown in Figures 14 and 15, we take exception to the conclusions in the Federal report relative to the influence of our treated effluent on fish kills in Mulat - Mulatto Bayou.

At the time of several of these fish kills, Cyanamid personnel personally observed the cited areas and the areas between such locations and our outfall. In all cases live, healthy fish were observed in the areas between the fish kills and our outfall.

The Federal report recommends on Page 56 that individually treated wastes from all contributors to the Bay should be equipped with outfalls located to take advantage of the maximum dilution potential of the Bay and to prevent unequal distribution of wastes. A further recommendation is made in the report that "more detailed studies of the circulation in Escambia Bay should be undertaken under a wider variation of fresh water inflow and tidal current movement," to optimize the placement of such outfalls.

We at American Cyanamid maintain that we have anticipated these observations and recommendations by more than 13 years and have applied the findings of our published Bay surveys in the form of an adequately located and soundly engineered outfall and dispersion system.

NUTRIENT REDUCTION

Cyanamid accepts the report that accelerated eutrophication of Upper Escambia Bay has resulted from increasing concentration of nutrients. Reduction by the amounts recommended will require tertiary treatment. To the best of our knowledge the technology for tertiary treatment to remove nitrogen has not been demonstrated as being economically and technologically viable. This should be considered in determining allowable waste discharges and establishing a schedule for compliance.

REGIONAL COLLECTION SYSTEM

We wish to reaffirm our willingness to participate in a joint and cooperative study of the technical and economic feasibility of the concept for regional collection, treatment and dispersion of wastes from all contributors in the area. Such a study should generate, furthermore, the kind of information needed to make a definitive judgment as to the need for tertiary treatment upon discharge to the Gulf of Mexico.

TABLE 1

ACRYLONITRILE CONCENTRATIONS

IN

CYANAMID'S EFFLUENT AND ESCAMBIA BAY

DATE	TIME	EFFLUENT	BAY WATER TIME	AT OUTFALL	TIME	300' FROM OUTFALL
1-17-70	0430	33 mg/l				
1-17	1930	37 "				
1-18	1945	32 "				
1-19	1200	28 "				
1-20	0930	4 "				
1-21	0915	< 2 "				
1-23	0900	< 2 "				
1-24	0430	7 "				
1-24	1000	2 "				
1-25	2000	7 "				
1-26	0430	19 "	1120	.16 mg/l		
1-26	2000	14 "				
1-27	0430	27 "	1100	.39 "	1100	.05 mg/l
1-27	2000	26 "				
1-28	0430	28 "	1100	.04 "	1100	.01 "
1-28	1830	22 "				
1-29	0500	3 "	0800	.11 "	0800	.12 "
1-29			1500	.03 "	1500	.01 "
1-30	0500	2 "	1500	.03 "	1500	<.01 "

GJK:rg
2/4/70

TABLE 2

BIOASSAY PROCEDURES AND RESULTS

PROCEDURE: Bioassay tests were conducted following STANDARD METHODS PROCEDURES, 12th edition. Tests were conducted in environment containing 75% undiluted effluent and 25% bay water. No aeration was used during the tests.

RESULTS:

TEST STARTED	TEST NO.	FISH TYPE	DURATION(c)
9/10/69	69-1	Cyproinodontidae(a) (Killifish Family)	72 hours
9/16/69	69-2	" "	72 hours
9/23/69	69-6	" "	72 hours
11/7/69	69-19	" "	72 hours
11/21/69	69-14	Mississippi Shiners(b)	900 hours
1/22/70	70-6	" "	72 hours

(a) Obtained from Mulatto Bayou or Indien Bayou

(b) Obtained from fish camp operator because local fish were unavailable due to cold weather.

(c) 100% survival at conclusion of all tests.

JJP:rg
1/30/70

American Cyanamid Company
Santa Rosa Plant

Analytical Instruction Code: 1.6.7.6
Date: 1-22-70

DETERMINATION OF ACRYLONITRILE (AN) IN LAGOON INFLUENT AND EFFLUENT WATER BY GAS CHROMATOGRAPHY (TENTATIVE)

A. Unusual Safety Precautions:

1. Observe the usual laboratory safety precautions.
2. Use care when working with hydrogen. Do not operate the instrument if leaks are present in the gas system. Check for leaks with a "gas and air leak detector" solution.

B. Principle:

The AN in the sample is vaporized and separated from water on a Porapak Q column. The AN is detected and measured using a hydrogen flame ionization detector.

C. Limitations:

1. The method, as written, is limited to Santa Rosa lagoon influent and effluent samples containing <100 ppm AN. However, other concentrations may be determined by adjusting the instrument sensitivity (attenuation).
2. Samples should be submitted in 8-, 16- or 32-oz. glass bottles with aluminum lined caps.

3. Samples should be refrigerated (~5°C) immediately following sampling and should be analyzed within 12 hours (see Reference 3).

D. References:

1. Pamphlet, "Porapak," Waters Associates, Inc., 1965.
2. Notebook #SR 9593, pp. 94, 192-199.
3. Standard Methods for the Examination of Water and Waste Waters, 12th Edition, 1965, p. 31.

E. Special Apparatus:

1. F&M 500 Gas Chromatograph with 1609 hydrogen flame ionization attachment.
2. Hamilton syringe - 5 µl.
3. Porapak Q, 80-100 mesh, 6'x¼", stainless steel column.
4. Bruning #72-031 ruler.

F. Reagents:

1. Pure acrylonitrile (99 + Mol %), e.g., chromatoquality acrylonitrile, Curtin No. AX 349.
2. Porapak Q, 80-100 mesh, Waters Associates, Inc.

G. Sample Preparation:

Using a glass stirring rod (~8 mm diam.), carefully mix the sample (avoid whipping air into sample).

LM/ESS

H. Calibration and Standardization:

1. Make the following instrument settings:

   a. Column temperature - 195°C
   b. Helium flow meter - 7.6 (~80 ml/min)
   c. Air flow meter - 7.3 (~300 ml/min)
   d. Hydrogen flow meter - 8.5 (~65 ml/min)
   e. Injection port - 150°C
   f. Block setting - 150°C
   g. Sensitivity: Range 10; Attenuator 2
   h. Chart speed - ½" per minute
   i. Column - Porapak Q, 80-100 mesh, 6' x ⅛", stainless steel
      NOTE: After column is installed, allow 16 hours for the column to come to equilibrium at the above conditions.

2. Preparation of standard curve:

   a. Weigh 1.000 g pure acrylonitrile in a 1,000-ml volumetric flask containing ~500 ml of distilled water.
   b. Dilute to volume with distilled water, stopper and mix by inversion.
   c. Using a 10-ml microburet, add 0, 1.00, 2.50, 5.00, 7.50 and 10.00 ml of the 1,000 ppm acrylonitrile stock solution to 100-ml glass-stoppered volumetric flasks containing 80-90 ml of distilled water.
   d. Bring to volume with distilled water. Stopper and mix by inversion. These standards contain 0, 10, 25, 50, 75 and 100 ppm of AN, respectively.
   e. Using a clean, dry 5-ul syringe, flush the syringe three times with the 0 ppm standard. When no air bubbles are present, pull 4-5 µl of the standard into the syringe. Release all but exactly 2 µl.
   f. Immediately inject in the injection port of the gas chromatograph and record for 20 minutes on an attenuation setting of 2 (Range 10).
      NOTE: Standards and samples must be at the same temperature when injected.
   g. Repeat steps "e" and "f" using standards containing 10, 25, 50, 75 and 100 ppm of AN.
   h. Draw a base line using the shoulders of the AN peak.
   i. Using a Bruning millimeter ruler, obtain the AN peak height.
   j. Prepare a standard curve by plotting the peak height vs. ppm AN on graph paper (20 x 20 mm).
      NOTE: A new set of standards and standard curve should be prepared prior to analyzing a series of samples.

I. Procedure:

Analyze in duplicate:

NOTE: Samples should be analyzed immediately after standard curve is prepared.

1. Using the same instrument conditions in H (1) and steps 2 (e) and 2 (f) in H (2) inject exactly 2 ul of the sample and record for 20 minutes.

LM/ESS

I. Procedure: (continued)

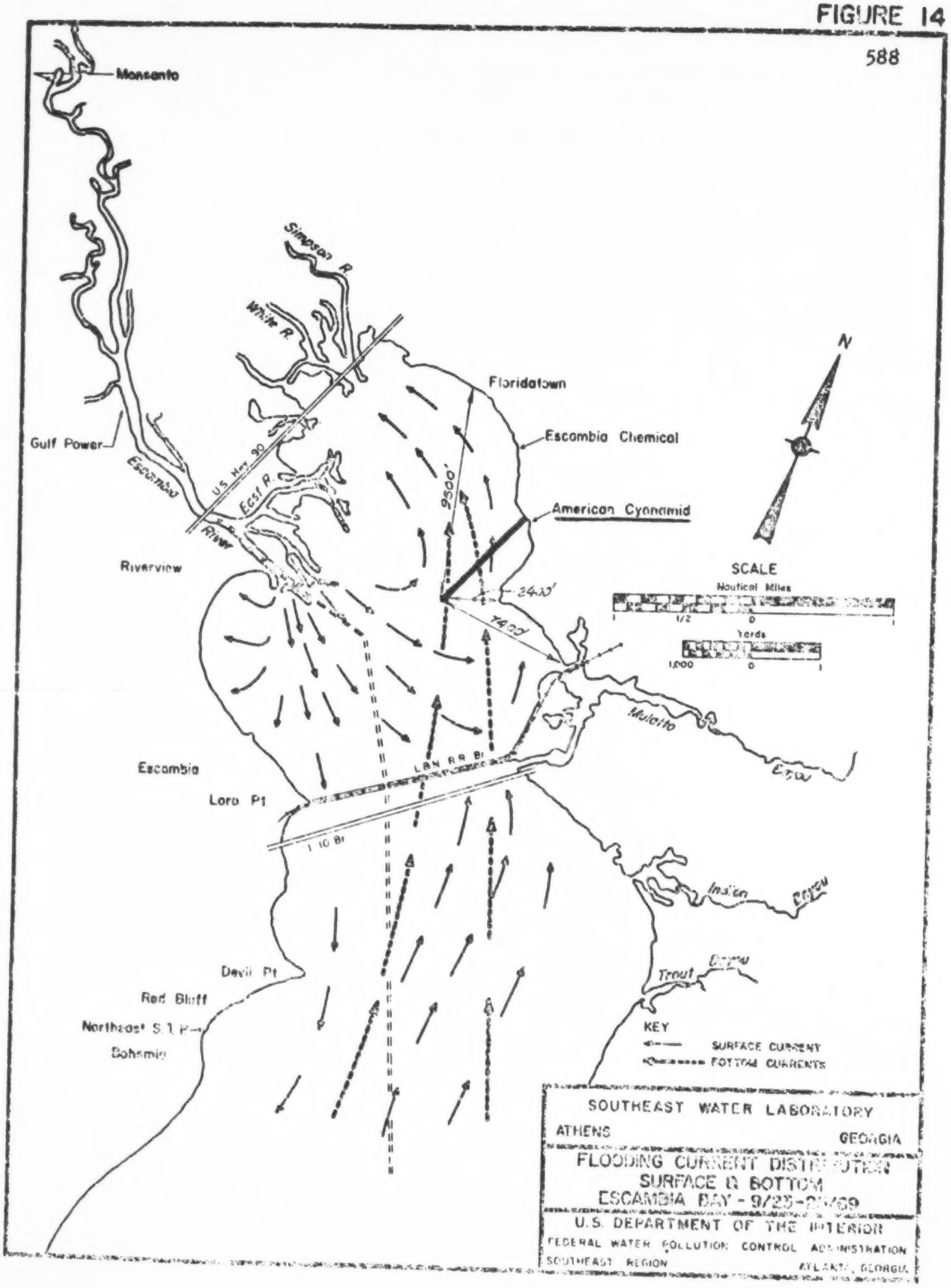
2. Draw a base line using the shoulders of the AN peak.
3. Using a Bruning millimeter ruler, measure the AN peak height.

J. Calculations:

Read the ppm acrylonitrile (AN) directly from the standard curve.

JM/ESS

FIGURE 14

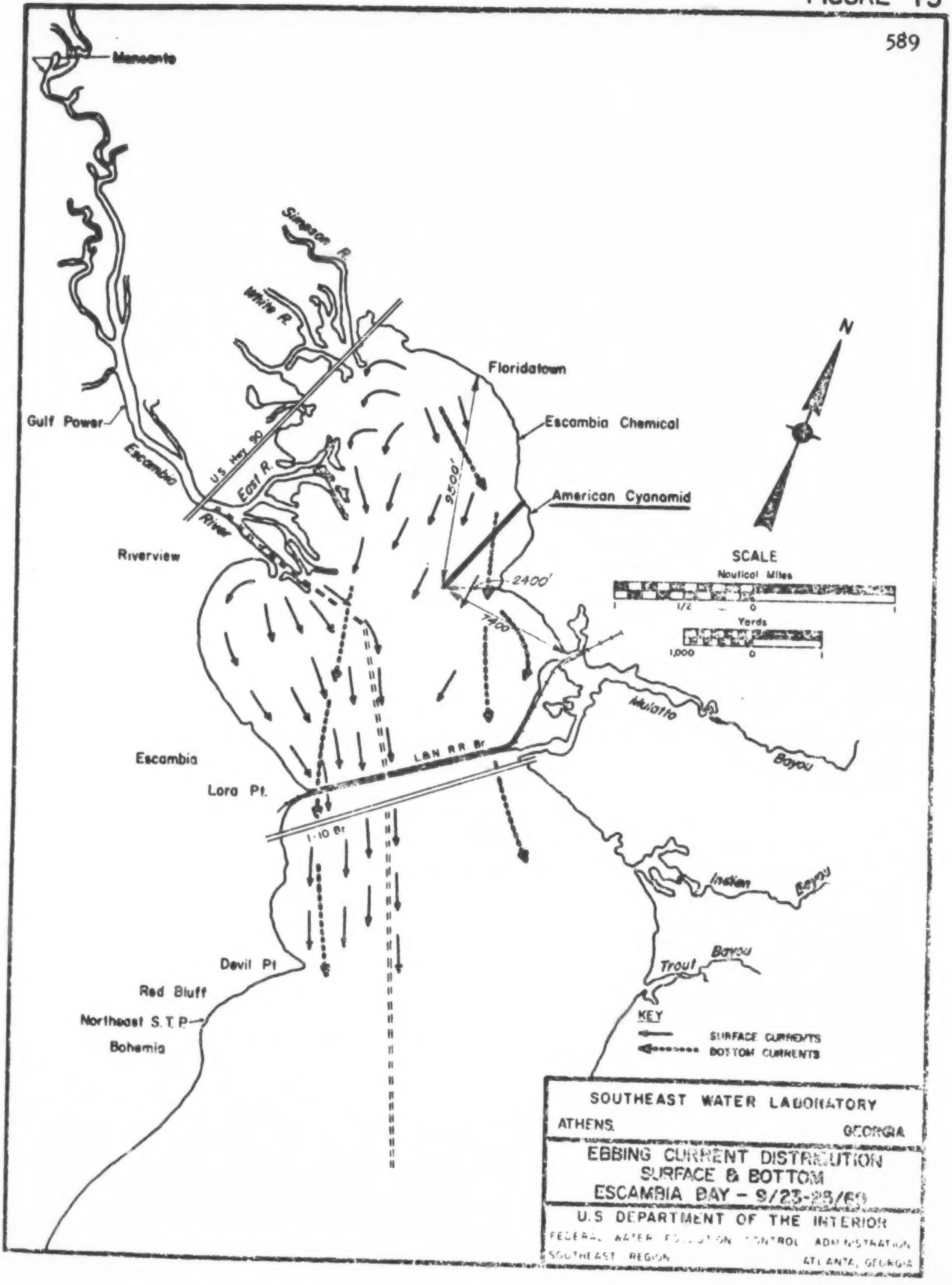

Monsanto
Simpson R.
White R.
U.S. Hwy 90
Gulf Power
Escambia River
East R.
Floridatown
Escambia Chemical
9500'
American Cyanamid
2400'
7400'
N
SCALE
Nautical Miles
1/2
0
1
Yards
1,000
0
1
Riverview
Mulatto Bayou
Escambia
Loro Pt.
L&N R.R. Br.
I-10 Br.
Indian Bayou
Devil Pt.
Trout Bayou
Red Bluff
Northeast S.T.P.
Bohemia
KEY
SURFACE CURRENT
BOTTOM CURRENTS

SOUTHEAST WATER LABORATORY
ATHENS GEORGIA

FLOODING CURRENT DISTRIBUTION
SURFACE & BOTTOM
ESCAMBIA BAY - 9/25-26/69

U.S. DEPARTMENT OF THE INTERIOR
FEDERAL WATER POLLUTION CONTROL ADMINISTRATION
SOUTHEAST REGION ATLANTA, GEORGIA

FIGURE 15


Monsanto
Simpson R.
White R.
Floridatown
Escambia Chemical
Gulf Power
U.S. Hwy 90
East R.
Escambia
River
American Cyanamid
9500'
Riverview
2400'
7400'
N
SCALE
Nautical Miles
1/2
0
1
Yards
1,000
0
Mulatto
Bayou
Escambia
L&N RR Br
Lora Pt.
I-10 Br
Indian
Bayou
Devil Pt
Red Bluff
Northeast S.T.P.
Bohemia
Trout
Bayou
KEY
SURFACE CURRENTS
BOTTOM CURRENTS

SOUTHEAST WATER LABORATORY
ATHENS GEORGIA

EBBING CURRENT DISTRIBUTION
SURFACE & BOTTOM
ESCAMBIA BAY - 9/23-25/69

U.S DEPARTMENT OF THE INTERIOR
FEDERAL WATER POLLUTION CONTROL ADMINISTRATION
SOUTHEAST REGION ATLANTA, GEORGIA

LOUISVILLE & NASHVILLE RAILROAD COMPANY

908 W. BROADWAY • LOUISVILLE, KENTUCKY 40201 • TELEPHONE 587-1121

DONALD D. STRENCH
VICE PRESIDENT-OPERATION

February 2, 1970

Mr. John R. Thoman
Regional Director, Southeast Region
Federal Water Pollution Control Administration
Department of the Interior
Suite 300
1421 Peachtree Street, N.E.
Atlanta, Georgia 30308

Re: Escambia Bay Conference
January 20, 1970

Dear Sir:

Thank you for your letter of January 14, 1970, relative to the above matter and for the enclosed copy of the report of your agency which we have noted with interest.

The L&N does not have any statement to make at this time but waives none of its rights and objections thereby. If some official action is taken requiring our attention, we will be pleased to hear from you.

Sincerely yours,

DDS:jl

FEB 27 1970

Mr. Donn O. Jennings
Senior Vice President
Container Corporation of
  America
One First National Plaza
Chicago, Illinois 60670

Dear Mr. Jennings:

Thank you for your recent letter forwarding the statement of Container Corporation of America amending and supplementing the oral statement made at the Escambia River Basin conference held January 20-21, 1970.

This statement will be made a part of the conference record.

Sincerely yours,

/sgd/ Murray Stein

Murray Stein
Conference Chairman

CCA
Container Corporation of America

One First National Plaza
Chicago, Illinois 60670

Phone: 312 786 5500

February 5, 1970

Mr. Murray Stein and Conferees
of Escambia Bay, Florida
Pollution Conference (January 20-21, 1970)
U. S. Department of Interior
Federal Water Pollution Control Administration
Washington, D. C. 20549

Gentlemen:

Enclosed is statement of Container Corporation of America amending and supplementing the oral statement made by our Mr. George H. Whiteside to the Escambia Bay pollution conference on January 20 and 21, 1970.

We wish to thank you for holding the record open to enable us to submit this supplemental statement.

Please contact Mr. Whiteside at our Brewton mill for assistance and cooperation in implementing the conclusions of the Conference.

Very truly yours,

CONTAINER CORPORATION OF AMERICA

By
Donn O. Jennings
Senior Vice President

EKM:lgj

Enclosure

cc: Messrs. John Thoman
Nathaniel P. Reed
Dr. Ira Myers

February 5, 1970

Mr. Murray Stein and Conferees
of Escambia Bay, Florida
Pollution Conference (January 20-21, 1970)

Gentlemen:

As provided for at the recent hearing, we submit this supplement to our statement of January 21, 1970 in a continuing effort to cooperate with the Federal Water Pollution Control Administration (FWPCA) and the respective state agencies concerned. It appears to us that our future operations and continued existence in this area will be determined largely by the action this conference takes. The following recommendations are thus the product of much consideration and profound concern.

First and foremost, we believe that CCA Brewton mill must be disassociated from any activity alleged to be responsible for the pollution of Escambia Bay. All the figures collected since 1956, which precedes the opening of the mill, substantiate that our effluent has no significant effect on this Bay. We have carried out limited Total Organic Carbon measurements in the time provided. Both our T. O. C. and that of the FWPCA are the result of very limited testing, but we have ordered equipment which will enable us to collect more extensive data on this basis.

The T.O.C. figures collected are submitted in Table I attached. We feel there still has not been sufficient opportunity to determine whether or not T.O.C. is a meaningful index of pulp mill contamination. But, if any conclusion can be drawn from these limited T.O.C. data, it is that the river has virtually, if not completely recovered from the effects of our outfall by the time it reaches the Highway 184 bridge in Florida. This same conclusion is supported by the BOD reading collected from all sources since 1956, including the FWPCA data incorporated into the conference record. Container's Brewton mill, therefore, should not be listed and dealt with as a source of pollution of the Escambia Bay.

We recognize that our Brewton operation, and indeed any industry, must be monitored by the duly constituted state and federal authority to ascertain the nature and extent of the pollution such industry may cause. It is recommended that you measure the mill for its effect on the lower Escambia River prior to its entering the Pensacola area, using the standard applicable to our industry. Since any contribution we could make to the pollution of the Escambia Bay must pass this point above Pensacola, we feel the purpose of the conference will be served by the establishment of this concept of measurement. We do not quarrel with your attempt to set a firm BOD limit by which we will be governed, even though this method of control is, to our knowledge, novel. We ask only that this limit be established by standards which bear on our industry and with respect to a body of water whose ecology we affect.

Data published by the National Council for Stream and Air Improvement has been obtained for the purpose of establishing a reasonable maximum discharge based on current industry practice. The national average of BOD produced by pulp mills comparable to ours is 75 pounds per ton produced. We currently operate below this figure due to extensive in-plant control procedures, but to establish a lower than average figure for us is to penalize us for our past efficient performance. Since 900 tons of pulp per day are produced at our Alabama mill, this would result in 67,500 pounds of raw BOD produced per day. If the 90% reduction to be required by Florida, which is also the reduction required by your current conclusion, is applied to the Brewton mill, 6,750 pounds per day of BOD would be the allowable discharge.

Our fixed cost at Brewton must be reduced by increasing production if the operation is to remain competitive. For this reason we are in the process of increasing our pulp production at Brewton by 150 tons per day, which, using the industry average, will increase BOD discharge to 7,875 pounds per day.

On January 22nd a conference of similar authority established a limit of 8,800 pounds BOD for St. Regis Paper Company's Cantonment, Florida mill whose effluent flows into Perdido Bay, not far from our Brewton plant. Your investigations which led to this recommendation disclose that St. Regis sends 88,800 pounds of raw BOD load to the ponds it uses to treat this effluent. A 38% reduction in BOD is worked in these ponds which means St. Regis discharges 55,000 pounds of BOD to Perdido Bay. Container Corporation's Brewton mill produces about the same amount of pulp as the St. Regis operation with a slightly greater percentage of this total pulp production attributable to bleached pulp which produces a higher BOD effluent than natural kraft pulp. As a consequence, Container Corporation generates at least an equal amount of BOD load per day as St. Regis. Ignoring any consideration for past performance, if a conference such as yours can recommend 8,800 pounds BOD as a limit for St. Regis, whose pulp production is about equal to Container's, surely due process demands that you allow Container Corporation 8,800 pounds of BOD discharge.

From 9,300 pounds per day, which we currently discharge, to 8,800 pounds of BOD per day is a very significant reduction when one considers the high level of treatment Container Corporation now provides and the problems inherent in removing the additional increment of BOD. Since it is shown by the data collected by the FWPCA and ourselves that our present rate of discharge has no appreciable adverse effect on the lower Escambia River, the reduction to 8,800 pounds BOD hereby recommended will not harm that River and is a figure all concerned can live with.

Projected containerboard demand indicates the need for a doubling of production capacity at the Brewton mill within the next 5 to 8 years. Such an installation would include pollution control equipment of the latest known technology. It is impossible at this stage to estimate what additional BOD such an expansion would create.

It is noted that color is to be monitored at the Highway 4 bridge near Century, Florida. We shall continue to search for a commercially feasible method of reducing the color associated with the treatment of our wastes and we will employ such a system when it becomes available.

Your Conference recommends that we remove 90% of the phosphorus you have concluded that we add. We submit the attached data in Table II to substantiate our contention that we do not add phosphorus to the Escambia River. From the data included it appears that phosphorus detected in our effluent is also present in our influent process water. Again we invite you to monitor us to verify this. We should not be asked to remove that which we do not put in and hence we respectfully request that you delete the recommendation with respect to the removal of phosphorus.

This statement has been presented in a sincere effort to reach common ground. We believe the Conference record, taken as a whole, supports Container's contention that its Brewton mill is not to be considered with respect to the pollution of Escambia Bay. Any allotment of operating rights based on the supposition that Container Corporation pollutes this Bay is devoid of foundation in the record and unacceptable. On the other hand, a standard based on measurable performance within our industry is theoretically sound and, what is perhaps more to the point, allows Container Corporation of America and its environment to co-exist.

CONTAINER CORPORATION OF AMERICA

By
Donn O. Jennings
Senior Vice President

TABLE I

Total Organic Carbon Content Of Conecuh-Escambia River *

Location	T.O.C., mg/1**			
	1/22/70	1/23/70	1/24/70	1/26/70
Edwards Bridge (Highway 41)		4	4	4
CCA Water Intake	5	2	4	3
CCA Outfall (Brewton Lake)	83	71	71	60
Little Escambia Creek	3	2	3	3
Big Escambia Creek	2	4	4	2
Century Bridge (Highway 4)	5	4	6	4
Bridge, Highway 184	5	5	5	4
Bridge, Highway 90	5	4	6	5

* Determined by Batelle Memorial Institute, Inc. using FWPCA analytical procedures.

** Grab samples.

TABLE II

Phosphorus Content of CCA Influent and Effluent*

	Date	Phosphorus, mg/l**	
		Total (P)	Ortho (P)
CCA River Water Intake	1/16/70	2.0	1.0
	1/21/70	2.6	2.0
	1/22/70	2.0	2.0
	1/23/70	3.0	3.0
	1/24/70	1.0	1.0
	1/25/70	3.0	3.0
	1/26/70	1.0	1.0
Average		2.1	1.9
Combined effluent at Spillway	1/16/70	1.3	0.0
	1/21/70	0.7	0.0
	1/22/70	2.6	2.0
	1/23/70	2.6	2.0
	1/24/70	0.3	0.0
	1/25/70	2.0	2.0
	1/26/70	2.6	2.0
Average		1.6	1.1

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* Determined by Gulf Coast Testing Laboratory (E. McGowan).
** Grab Sample.

MAR 11 1970

Mr. Vincent D. Patton
Executive Director
Department of Air and Water
Pollution Control
315 South Calhoun Street
Tallahassee, Florida 32301

Dear Mr. Patton:

Thank you for your letter of March 3, 1970, enclosing the letter from Mr. Bob Jones, Executive Secretary, Southern Fisheries Association, Inc., regarding the recent conferences in Escambia County.

Mr. Jones' letter will be made a part of the record and included in the transcripts of the proceedings of both the Escambia Basin and Perdido Bay Enforcement Conferences.

Sincerely yours,

/sgd/ Murray Stein

Murray Stein
Assistant Commissioner
Enforcement

STATE OF FLORIDA
DEPARTMENT OF
AIR & WATER POLLUTION CONTROL
SUITE 300, TALLAHASSEE BANK BUILDING
315 SOUTH CALHOUN STREET, TALLAHASSEE, FLORIDA 32301
TELEPHONE (904) [illegible] 224-9151

VINCENT D. PATTON
EXECUTIVE DIRECTOR

NATHANIEL P. REED
CHAIRMAN

March 3, 1970

Mr. Murray Stein
Assistant Commissioner
Office of Enforcement
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C.

Dear Murray:

I have enclosed a letter we have received from Mr. Bob Jones, Executive Secretary of the Southern Fisheries Association regarding the recent conferences in Escambia County.

I would appreciate it if you could include this letter in the official transcript of the two meetings.

Sincerely,

Vincent

Vincent D. Patton

VDP:lb

Enclosure

CHARLES M. DAVIS **JOHN P. ROBERTS** **JAY E. SCHENCK** **A. D. VINCENT**

SOUTHEASTERN FISHERIES ASSOCIATION, INC.
ALABAMA • FLORIDA • GEORGIA • NORTH CAROLINA • SOUTH CAROLINA
EXECUTIVE OFFICES 224 CENTER BLDG - (AC 904) 224-0612 - 330 SO ADAMS ST - TALLAHASSEE FLORIDA 32301
ROBERT P JONES - RESIDENCE PHONE 877-3722 MRS RICHARD M LEE - RES PHONE 224-8255

January 30, 1970

Mr. Nat Reed, Chairman
Florida Air & Water Pollution Control Commission
The Capitol
Tallahassee, Florida

Dear Mr. Reed:

It was a rewarding experience to sit in on the pollution hearings recently held in Pensacola. It is the feeling of the Southeastern Fisheries Association that your group and the Federal Water Pollution Control Commission has embarked on a historic program to clean up the polluted waters of Escambia and Santa Rosa Counties.

It is a fact that shrimp, fish and oyster production in Escambia County has declined dramatically over the years. I feel certain that any of the wholesale seafood dealers in Pensacola could provide you with detailed figures relating to the production in that area if you have need of them.

It is a fact that over 25 fish kills have been reported in Escambia or Santa Rosa County in recent years and some kind of figure could be obtained as to the number of fish killed that floated to the top of the water. What can't be proven is how much marine life was annihilated and sunk to the bottom of the bay. A fish kill reminds me of an iceberg inasmuch as one sees very little of the danger above the water. Many marine animals sink when they die. Any assessment of damage must take these individuals into account.

Commercial fishing means about $3 million annually to Escambia County. This cannot compare with the heavy industry of the county in dollars but our industry does provide jobs and produces food for human consumption that is needed as an excellent source of protein. It seems to us that we have a right to pursue happiness by working in the commercial fishing industry and that we shouldn't be denied this right because of pollution regardless of its source.

FLORIDA SHRIMP ASSOCIATION, INC., A SUBSIDIARY

Page 2
Mr. Nat Reed

We also believe, and this can be checked with state biologists, that the oyster production could increase 100 times if the pollution problem was alleviated. Florida's waters are ideal for oyster growing and there is no doubt we could be the leading oyster producing state in the nation and have an industry worth hundred of millions of dollars if we could harvest oysters in all the waters.

Our Association salutes what you are trying to do for all the people.

Sincerely yours,

Bob Jones
Executive Secretary

nl

cc: Directors of Southeastern Fisheries Association
Hodges, Shields, Ingle, Department of Natural Resources

ESCAMBIA CHEMICAL CORPORATION
A SUBSIDIARY OF
Air Products and Chemicals INC.
P.O. Box 467, Pensacola, Florida 32502

T. L. CAREY
President

March 6, 1970

Mr. David Shedroff
Federal Water Pollution Control Administration
1421 Peachtree - N. E.
Atlanta, Georgia 33009

Dear Mr. Shedroff:

This is to inform you that Escambia Chemical Corporation will not have any further statements to modify or add to those which were presented at the Federal-State Escambia Bay Conference January 20, 1970.

Yours very truly,

T. L. Carey

TLC/nc

DEPARTMENT OF DEFENSE

DEPARTMENT OF THE ARMY
South Atlantic Division, Corps of Engineers
510 Title Building, 30 Pryor Street, S.W.
Atlanta, Georgia 30303

SADYN/SADKO

7 April 1970

Mr. John R. Thoman, Regional Director
Southeast Region
Federal Water Pollution Control Adm.
Department of the Interior
Suite 300, 1421 Peachtree St., N. E.
Atlanta, Georgia 30309

Dear Mr. Thoman:

Your letter of 18 March 1970 to the Division Engineer (Attn: Herbert Rogers) inclosing the Secretary of the Interior's official summaries of the Perdido and Escambia conferences is acknowledged. The District Engineer, Mobile District, in a letter of 17 March 1970 to your office indicated certain reservations concerning the language that was used in the recommendations in the draft copy of the summaries of the two conferences. This same language now occurs in the Secretary's official summaries. Mr. Rogers has indicated by phone to Mr. John Wakefield that we wished the District Engineer's letter to be entered into both conference proceedings.

The District Engineer has stated the Division's position regarding policies on permits for dredging and filling. Permit applications are processed in accordance with existing statutes and coordinated through the Department of Interior's Regional Coordinator in accordance with the joint Army-Interior Memorandum of Understanding executed on 13 July 1967. Comments by all agencies are then considered in making the decision on the issuance of a Department of Army permit. On Congressionally authorized projects the Corps coordinates the planning for construction and maintenance with all interested State and Federal agencies. Comments are considered in carrying out the directives of Congress.

Sincerely,

R P Tabb

R. P. TABB
Colonel, Corps of Engineers
Deputy Division Engineer

DEPARTMENT OF THE ARMY
MOBILE DISTRICT, CORPS OF ENGINEERS
P. O. BOX 2288
MOBILE, ALABAMA 36601

IN REPLY REFER TO

SAMOP-O

17 March 1970

Mr. John R. Thoman
Regional Program Director
Southeast Region - FWPCA
1421 Peachtree St., N. E.
Atlanta, Georgia 30309

Dear Mr. Thoman:

This office presented a formal statement at the Federal-State Enforcement Conferences on Pollution of Perdido River and Bay and Escambia River and Bay. In these statements I referred to the Corps' authority and program under Section 10 of the River and Harbor Act approved 3 March 1899 regarding the issuance of permits and regulation of dredging in navigable waters. The point was also made that on pollution problems associated with dredging operations, full coordination and collaboration with all appropriate Federal and State agencies are carried out.

In line with the above, my office has reviewed the proposed recommendations from the two conferences and I have some reservations about the recommendation halting construction dredging until a plan for development of the shoreline has been established. Also, some of the language requiring "diking the dredging area" needs revision. The disposal of all dredged material on upland spoil sites presents real problems in a built-up area where such sites are not available or are remotely removed from the dredging operations.

In addition to operating under a Federal statute regarding permits, the Corps is also coordinating its dredging permit program in accordance with various Federal legislation, executive orders and Corps regulations. The results you are trying to obtain with the proposed recommendation are commendable but it is questionable as to whether it can be accomplished in accordance with the language of the draft.

The Corps of Engineers is well aware of the need for an appropriate coordination of proposed activities in navigable waters under a Department of the Army permit. Recognition of this responsibility, as well as procedural arrangements incident thereto, is covered in the Memorandum of Understanding executed on 13 July 1967 by the Secretaries of the Army and Interior. The Secretary of the Army recently further clarified his position on this subject in a letter to the Governor of Florida wherein he stated:

> "We are particularly concerned over the development of satisfactory policies to control the use of shallow areas between mean low and mean high water, where the underlying lands are in private ownership, but where filling operations are subject to Federal jurisdiction. We have a similar concern with submerged areas below mean low water which may be in private ownership as a result of conveyances from the State, or otherwise. Until Florida's plans for regulating the development of its coastal areas are fully implemented, I believe that we at Federal level will be required to proceed cautiously in our review of major permit applications which may have a significant impact on fish and wildlife values, or which may permanently and irrevocably alter coastal areas. While we will not suspend the processing of major permit applications, and may, in cases in which the general public interest clearly requires it, approve such applications, I believe all concerned Florida officials at the State, County, and Municipality level, as well as those individuals and concerns contemplating development work requiring permits from the Army Corps of Engineers, should be aware that future applications will not be routinely approved."

This statement of policy is considered applicable not only to Florida but to the other states as well when similar considerations are involved. Therefore, we will continue our permit activities in keeping with the Memorandum of Understanding and the above stated policy of the Secretary of the Army.

Federal navigation and Flood Control projects, involving dredging, are authorized by the Congress following comprehensive studies in which the views of all concerned Federal and State agencies are carefully considered. These projects are authorized in the general public interest. Accordingly, we propose to continue the construction and maintenance of these projects in keeping with the direction of the Congress, but with full coordination of proposed work with all Federal and State agencies having valid interests therein from the viewpoint of water and air pollution, public health, fish and wildlife, preservation of the environment, and the general public interest.

Sincerely yours,

ROBERT E. SNETZER
COL, Corps of Engineers
District Engineer

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